SUPER®

# SUPER® X8DTU
# SUPER® X8DTU-F

# USER'S MANUAL

Revision 1.20

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Manual Revision 1.20

Release Date: Oct. 24, 2012

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# Preface

## About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPERMICRO X8DTU/X8DTU-F motherboard.

## About This Motherboard

The SUPERMICRO X8DTU/X8DTU-F supports the Intel 5500/5600 Series processors, the first dual-processing platform that offers the Intel QuickPath Interconnect (QPI) Technology, providing the next generation point-to-point system interface to replace the current Front Side Bus. With the 5500/5600 Series Processor built in, the X8DTU/X8DTU-F substantially enhances system performance with increased bandwidth and unprecedented scalability, optimized for High Performance Computing (HPC)/Cluster servers and intensive applications. Please refer to our web site (http://www.supermicro.com/products/) for processor and memory support updates. This product is intended to be installed and serviced by professional technicians.

## Manual Organization

**Chapter 1** describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

**Chapter 2** provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory and system setup stored in the CMOS.

**Chapter 4** includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

**Appendix A** lists BIOS POST Error Codes**. Appendix B** provides software installation instructions.

## Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself:

**Warning:** Important information given to ensure proper system installation or to prevent damage to the components.

**Note:** Additional Information given to differentiate various models or to ensure correct system setup.

## Contacting Supermicro

**Headquarters**

| | |
|---|---|
| Address: | Super Micro Computer, Inc. |
| | 980 Rock Ave. |
| | San Jose, CA 95131 U.S.A. |
| Tel: | +1 (408) 503-8000 |
| Fax: | +1 (408) 503-8008 |
| Email: | marketing@supermicro.com (General Information) |
| | support@supermicro.com (Technical Support) |
| Web Site: | www.supermicro.com |

**Europe**

| | |
|---|---|
| Address: | Super Micro Computer B.V. |
| | Het Sterrenbeeld 28, 5215 ML |
| | 's-Hertogenbosch, The Netherlands |
| Tel: | +31 (0) 73-6400390 |
| Fax: | +31 (0) 73-6416525 |
| Email: | sales@supermicro.nl (General Information) |
| | support@supermicro.nl (Technical Support) |
| | rma@supermicro.nl (Customer Support) |

**Asia-Pacific**

| | |
|---|---|
| Address: | Super Micro Computer, Inc. |
| | 4F, No. 232-1, Liancheng Rd |
| | New Taipei City 235 |
| | Taiwan |
| Tel: | +886-(2) 8226-3990 |
| Fax: | +886-(2) 8226-3991 |
| Web Site: | www.supermicro.com.tw |
| Technical Support: | |
| Email: | support@supermicro.com.tw |
| Tel: | +886-(2)-8226-3990 |

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# Chapter 1

# Introduction

## 1-1 Overview

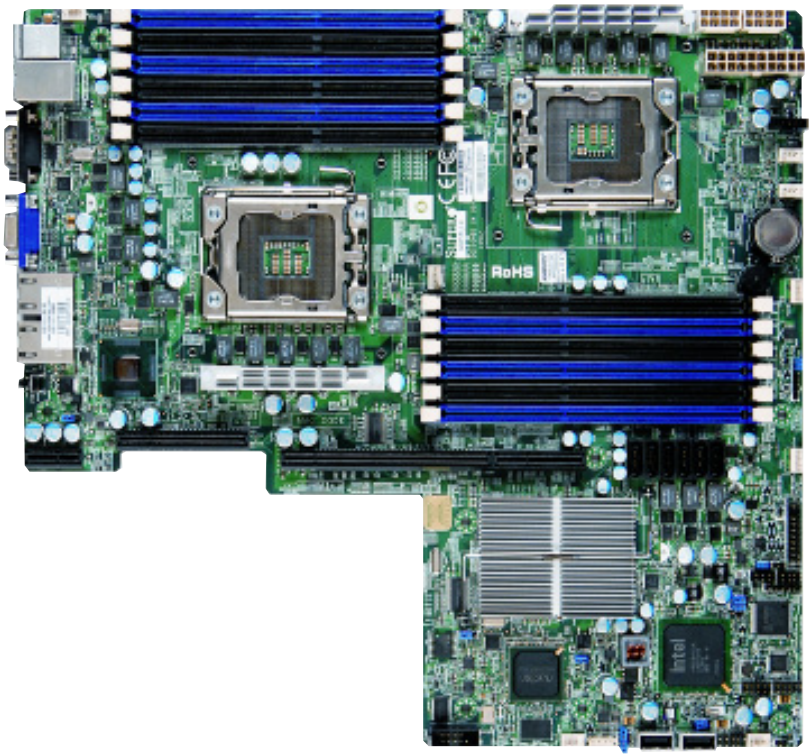
### Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

The following items are included in the retail box.

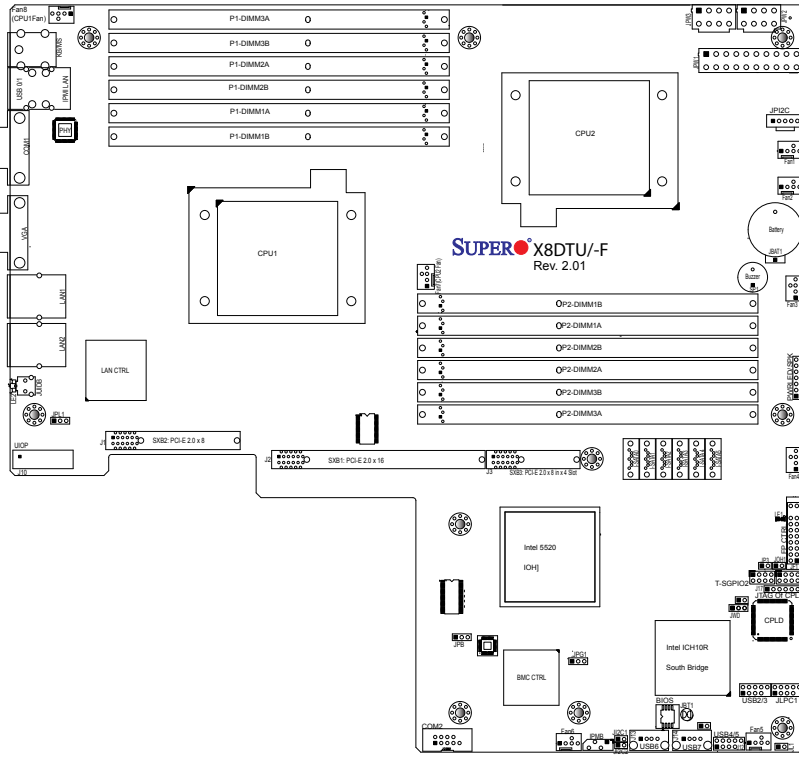
- One (1) Supermicro Mainboard)
- Six (6) Serial ATA cables (CBL-0044Lx6)
- One (1) I/O backpanel shield (CSE-PT7L) (For X8DTU)
- One (1) I/O backpanel shield (MCP-260-00027-0N) (For X8DTU-F)
- One (1) Supermicro CD containing drivers and utilities
- One (1) User's/BIOS Manual (MNL#1081)

## SUPER X8DTU/X8DTU-F Image




**Note:** The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.

## SUPERO X8DTU/X8DTU-F Motherboard Layout



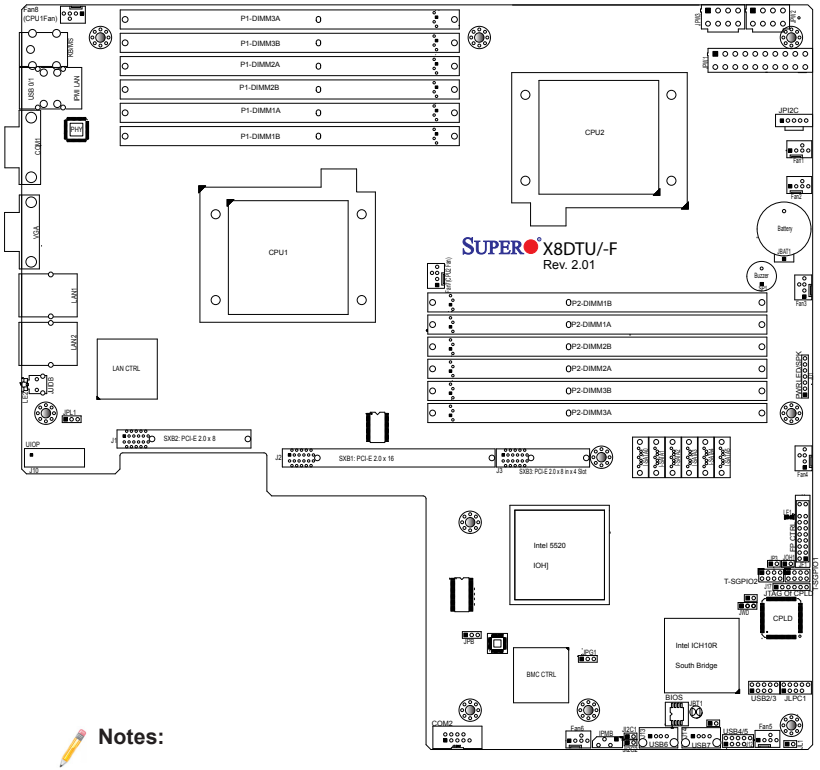

### Differences between X8DTU and X8DTU-F

| | X8DTU | X8DTU-F |
|---|---|---|
| **SATA (ICH10R)** | Yes | Yes |
| **IPMI 2.0/1.5 w/KVM** | No | Yes |
| **WPCM450 BMC** | No | Yes |
| **Dedicated LAN & PHY chip** | No | Yes |

**Note**

IPMI 2.0, WPCM450 BMC Controller, the PHY chip and Dedicated LAN port w/KVM support are available on the X8DTU-F only. For more information, refer to the user guide posted on our website @ http://www.supermicro.com/support/manuals/

## X8DTU/X8DTU-F Quick Reference




**Notes:**

1. Jumpers not indicated are for test purposes only.
2. See Chapter 2 for detailed information on jumpers and connectors
3. "■" indicates the location of Pin 1.
4. When LE1 LED is on, the onboard power connection is on. Make sure to unplug the power cables before removing or installing components.
5. IPMI (Intelligent Platform Management Interface) 2.0 is supported by the X8DTU-F. For more information on IPMI configuration, refer to the Embedded BMC IPMI User Guide @http://www.supermicro.com/support/manuals/.

**Warning**! To prevent damage to the power supply or motherboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these connectors to the 20-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

## X8DTU/X8DTU-F Quick Reference

| Jumper | Description | Default Setting |
|---|---|---|
| JBT1 | CMOS Clear | (See Chapter 2) |
| JI²C1/JI²C2 | SMB to PCI-Exp. Slots | Off (Disabled) |
| JPG1 | VGA Enable | Pins 1-2 (Enabled) |
| JPL1 | LAN1/2 Enable | Pins 1-2 (Enabled) |
| JWD | Watch Dog | Pins 1-2 (Reset) |

| Connector | Description |
|---|---|
| COM1/COM2 | COM1/COM2 Serial Port/Header |
| FAN 1-8 | System/CPU Fan Headers (Fans 7~8: CPU Fans) |
| IPMB | IPMB I²C Header (for an IPMI Card) (X8DTU-F) |
| JD1 | Speaker/Power LED Header (Pins 4~7: Speaker) |
| JF1 | Front Panel Control Connector |
| JL1 | Chassis Intrusion Header |
| JOH1 | Overheat LED Header |
| JPI²C | Power Supply SMBbus I²C Header |
| JPW1 | 20-pin ATX Main Power Connector |
| JPW2/JPW3 | 8-pin Secondary PWR Connector (**Warnings** on P.1-4) |
| JUIDB | Rear Unit Identifier Switch |
| LAN1/2 | Gigabit Ethernet (RJ45) Ports |
| IPMI_LAN | IPMI 2.0 Dedicated LAN (X8DTU-F) |
| I-SATA0 ~ I-SATA5 | (Intel South Bridge) SATA Ports |
| T-SGPIO-1/T-SGPIO-2 | Serial General Purpose Input/Output Headers |
| UIOP | Universal IO Riser Card Power Connector (Required for Add-on cards) (See the Warning below.) |
| (B/P) USB0/1 | (Back Panel) Universal Serial Bus (USB) Ports |
| F/P USB 2/3 4/5, 6, 7 | Front Panel Accessible USB Headers |
| VGA | Video Port |

| LED | Description |
|---|---|
| LE1 | Onboard Standby PWR warning LED Indicator |
| LE2 | Unit Identifier LED |

**Warning!** To provide adequate power to the add-on cards installed on the motherboard, please connect the UIOP PWR connector to the power supply for these cards to work properly.

## Motherboard Features

### CPU

- Two Intel® 5500/5600 Series (LGA 1366) processors; each processor supports two full-width Intel QuickPath Interconnect (QPI) links with a total of up to 51.2 GT/s Data Transfer Rate (6.4 GT/s per direction)

### Memory

- Twelve 240-pin DIMM sockets support up to 192 GB* of DDR3 Registered ECC or up to 48 GB of Unbuffered ECC/Non-ECC DDR3 1333 MHz/1066 MHz/800 MHz in 12 DIMM modules. (*Refer to Supermicro's memory recommendation list posted on our website at www.supermicro.com. See Section 2-4 in Chapter 2 for DIMM Slot Population.)

### Chipset

- Intel 5520 chipset, including: the 5520 (North Bridge) and the ICH10R (South Bridge).

### Expansion Slots

- One PCI-E 2.0 x16 slot (J2: SXB1)
- One PCI-E 2.0 x8 slot (J1: SXB2)
- One PCI-E 2.0 x8 in x4 slot (J3: SXB3)

### BIOS

- 32 Mb AMI SPI Flash ROM
- PCI 2.3, ACPI 1.0/2.0/3.0, Plug and Play (PnP), DMI 2.3, USB Keyboard support, Hardware BIOS Monitoring, and SMBIOS 2.3

### PC Health Monitoring

- Onboard voltage monitors for CPU1 Vcore, CPU2 Vcore, CPU1 DIMM, CPU 2 DIMM, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt.
- Fan status monitor with firmware control
- CPU/chassis temperature monitors
- Platform Environment Control Interface (PECI) ready
- Thermal Monitor 2 (TM2) support
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- Pulse Width Modulation (PWM) Fan Control
- CPU thermal trip support for processor protection, power LED
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU cores
- System overheat/Fan Fail LED Indicator and control

- Chassis intrusion detection
- System resource alert via Supero Doctor III

### ACPI Features

- Slow blinking LED for suspend state indicator
- Main switch override mechanism
- ACPI Power Management
- Keyboard Wakeup from Soft-off

### Onboard I/O

- Intel ICH10R supports six SATA ports (with support of RAID0, RAID1, RAID10, RAID5 in the Windows OS Environment, and RAID 0, RAID 1, RAID 10 for the Linux OS)
- Intel 82576 dual-channel Gigabit Ethernet controller supports dual Giga-bit LAN ports (LAN 1/LAN 2)
- A PHY chip supports an IPMI_Dedicated LAN on the X8DTU-F
- One VGA Port supported by the Winbond WPCM450 BMC Controller
- Two COM ports(1 header, 1 port)
- PS/2 mouse and PS/2 keyboard ports
- Up to eight USB 2.0 (Universal Serial Bus) (2 Rear Ports, 2 Front Headers, and 2 Type A Headers)
- Super I/O: Winbond W83527HG
- IPMI 1.5/2.0 with full KVM support (X8DTU-F only)

**Note**: IPMI 1.5/2.0 is supported by the X8DTU-F. For more information on IPMI configuration, refer to the Embedded BMC IPMI User Guide @http://www.supermicro.com/support/manuals/.

### Other

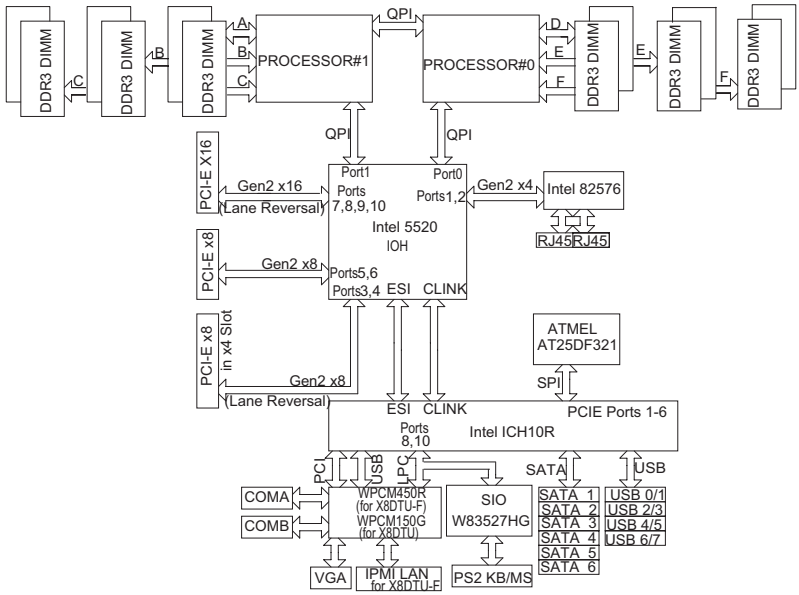
- Console redirection
- Onboard Fan Speed Control by Thermal Management via BIOS

### CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

### Dimensions

- Proprietary 13.05" (L) x 12.075" (W) (331.47 mm x 306.71 mm)




**System Block Diagram**

**Note:** This is a general system block diagram for the motherboard. For detailed information on motherboard features, refer to the Motherboard Features Section.

## 1-2 Chipset Overview

Built upon the functionality and the capability of the Intel 5520 platform, the X8DTU/X8DTU-F motherboard provides the performance and feature set required for dual-processor-based high-end systems with configuration optimized for HPC/Cluster servers and intensive applications. The 5520 platform consists of the 5500/5600 Series (LGA 1366) processor, the 5520 (IO Hub), and the ICH10R (South Bridge). With the Intel QuickPath interconnect (QPI) controller built in, the 5500/5600 Series Processor is the first dual-processing platform that offers the next generation point-to-point system interconnect interface greatly enhancing system performance by utilizing serial link interconnections, allowing for increased bandwidth and scalability.

The IOH connects to each processor through an independent QuickPath Interconnect (QPI) link. Each link consists of 20 pairs of unidirectional differential lanes for data transmission in addition to a differential forwarded clock. A full-width QPI link pair provides 84 signals. Each processor supports two QuickPath links, one going to the other processor and the other to the 5520 North Bridge.

The 5520 chipset supports up to 36 PCI Express Gen2 lanes, peer-to-peer read and write transactions. The ICH10R provides up to 6 PCI-Express ports, six SATA ports and eight USB connections.

In addition, the 5520 chipset also offers a wide range of RAS (Reliability, Availability and Serviceability) features. These features include memory interface ECC, x4/x8 Single Device Data Correction (SDDC), Cyclic Redundancy Check (CRC), parity protection, out-of-band register access via SMBus, memory mirroring, memory sparing, and Hot-plug support on the PCI-Express Interface.

### Main Features of the 5500/5600 Series Processor and the 5520 Chipset

- Four processor cores in each processor with 8MB shared cache among cores
- Two full-width Intel QuickPath interconnect (QPI) links, up to 6.4 GT/s of data transfer rate in each direction
- Virtualization Technology, Integrated Management Engine supported
- Point-to-point cache coherent interconnect, Fast/narrow unidirectional links, and Concurrent bi-directional traffic
- Error detection via CRC and Error correction via Link level retry

## 1-3 Special Features

### Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on) or for it to automatically return to a power- on state. See the Advanced BIOS Setup section to change this setting. The default setting is **Last State**.

## 1-4 PC Health Monitoring

This section describes the PC health monitoring features of the X8DTU/X8DTU-F. All have an onboard System Hardware Monitor chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: Onboard voltage monitors for CPU1 Vcore, CPU2 Vcore, CPU1 DIMM, CPU2 DIMM, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

### Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS (under Hardware Monitoring in the Advanced Setting).

### Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

To avoid possible system overheating, please be sure to provide adequate airflow to your system.

### System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. Supero Doctor is used to

notify the user of certain system events. For example, you can also configure Supero Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a pre-defined range.

## 1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 2003 and Windows 2008Operating Systems.

### Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

## 1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The X8DTU/X8DTU-F can accommodate 20-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, two 12V 8-pin power connections are also required to ensure adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

**Warnings**: 1. To prevent damage to the power supply or motherboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these connectors to the 20-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard. 2. To provide adequate power to the add-on cards installed on the motherboard, please connect the UIOP PWR connector to the power supply.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (For more information, please refer to the web site at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

## 1-7 Super I/O

The Super I/O supports two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

## 1-8 Overview of the Winbond WPCM450 Controller (For X8DTU-F Only)

The Winbond WPCM450 Controller is a Baseboard Management Controller (BMC) that supports the 2D/VGA-compatible Graphics Core with the PCI interface, Virtual Media, and Keyboard/Video/Mouse Redirection (KVMR) modules. With blade-oriented Super I/O capability built-in, the WPCM450 Controller is ideal for legacy-reduced server platforms.

The WPCM450 interfaces with the host system via a PCI interface to communicate with the Graphics core. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides LPC interface to control Super IO functions. The WPCM450 is connected to the network via an external Ethernet PHY module.

The WPCM450 communicates with onboard components via six SMBus interfaces, fan control, and Platform Environment Control Interface (PECI) buses.

**Note:** For more information on IPMI configuration, please refer to the Embedded IPMI User's Guide posted on our website @ http://www.supermicro.com/support/manuals/.

# Chapter 2

# Installation

## 2-1 Standardized Warning Statements

The following statements are industry-standard warnings provided to warn the user of situations when potential bodily injury may occur. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this section in its entirety before installing or configuring components in the system.

### Battery Handling

**Warning!** There is a danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. (Refer to Chapter 3 for more information on used battery disposal.

**警告**

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

**警告**

**电池更换不当会有爆炸危险，请只用同类电池或制造商推荐的功能相当的电池更换原有电池，请按制造商的说明处理废旧电池。**

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

**¡Advertencia!**

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

**Attention**

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

**תקנון הצהרות אזהרה**

הצהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים.

יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

**تحذير**

**هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة فعليك استبدال البطارية بنفس النوع أو ما يعادلها مما أوصت به الشركة المصنعة فقط**

**تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة**

**주의**

건전지가 부정확하게 대체되는 경우에 폭발의 위험이 있다. 제조자에 의해 추천된 동일한 것 또는 동등한 유형으로서만 건전지를 교환하십시오. 제조자 지시에 따라 사용한 건전지를 처분하십시오

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

## Product Disposal

**Warning!** Ultimate disposal of this product should be handled according to all national laws and regulations.

警告
本产品的废弃处理应根据所有国家的法律和规章进行

警告
この製品を廃棄処分する際は、各国の法律および規制に従って取り扱ってください。

Warnung
Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!
Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention
La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

אזהרה !
קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף
את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

تحذير
التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين
واللوائح الوطنية عند

주의
해당 국가의 관련 법규 및 규정에 따라 이 장치를 폐기해야 합니다.

Waarschuwing
De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

## 2-2 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

### Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

## 2-3 Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray. **Note**: Some components are very close to the mounting holes. Please take precautionary measures to prevent damage to these components when installing the motherboard to the chassis.

### Tools Needed

1. Phillips Screwdriver

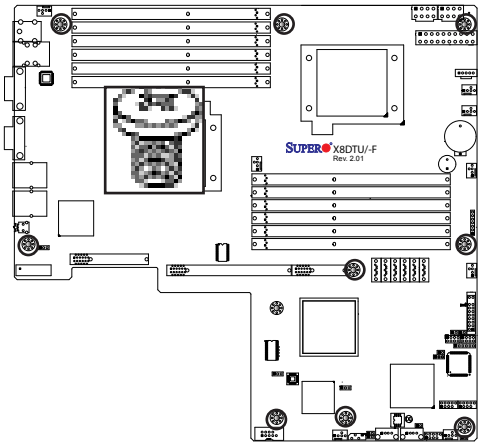
2. Pan head #9 screws

### Installation Instructions

1. Install the IO shield into the chassis.

2. Locate the mounting holes on the motherboard. Refer to the layout above for mounting hole locations.

**Locations of Mounting Holes**




3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.

4. Install standoffs in the chassis as needed.

5. Install the motherboard into the chassis carefully to avoid damage to motherboard components.

**Warning**: To avoid damaging the motherboard and its components, please do not apply any force greater than 8 *lb/sq.in* (8 lbs. per square inch) when installing a screw into a mounting hole.

6. Insert a Pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis, using a Phillips screwdriver.

7. Repeat Step 4 to insert #6 screws to all mounting holes.

8. Make sure that the motherboard is securely placed on the chassis.

## 2-4 Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan.

**Notes:**

1. Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

2. Make sure to install the motherboard into the chassis before you install the CPU heatsink and heatsink fans.

3. When purchasing a motherboard without the 5500/5600 Series processor preinstalled, make sure that the CPU socket plastic cap is in place, and none of the CPU socket pins are bent; otherwise, contact the retailer immediately.

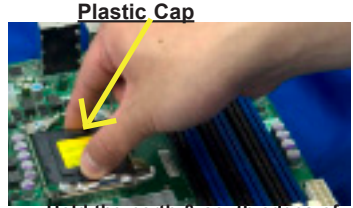
4. Refer to the MB Features Section for more details on CPU support.

### Installing an LGA 1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locking position.

2. Gently lift the socket clip to open the load plate.

3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.



1. After removing the plastic cap, using your thumb and the index finger, hold the CPU at the north and south center edges.

2. Align the CPU key, the semi-circle cutout, against the socket key, the notch below the gold color dot on the side of the socket.

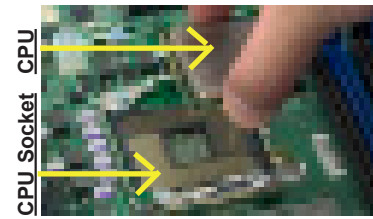
3. Once both the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. (Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.)

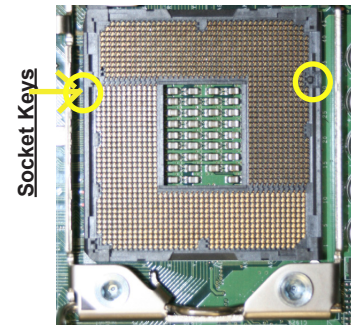
4. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

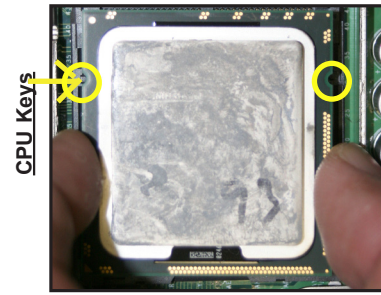
5. Once the CPU is securely seated on the socket, lower the CPU load plate to the socket.

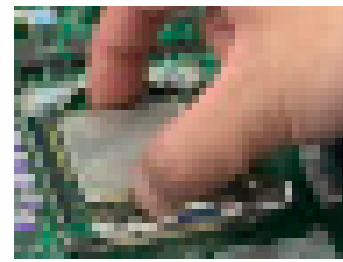
6. Use your thumb to gently push the socket clip down to the clip lock.

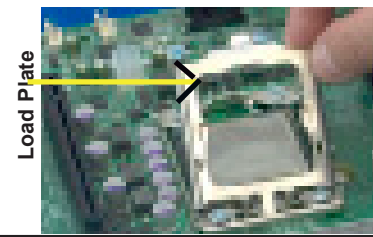
**Warning**: Please save the plastic cap. The motherboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed will cause damage to the socket pins.



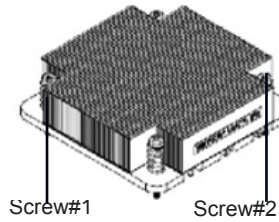



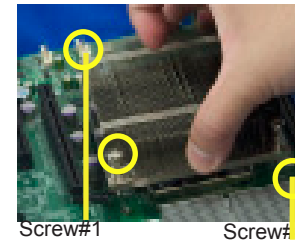


## Installing a CPU Heatsink

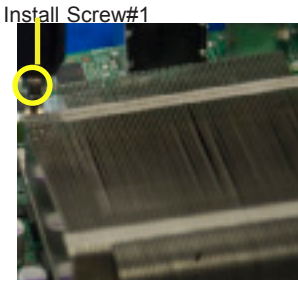
1. Do not apply any thermal grease to the heatsink or the CPU die because the required amount has already been applied.



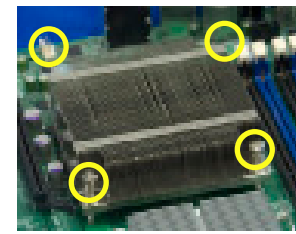

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.




3. Install two diagonal screws (ie the #1 and the #2 screws) and tighten them until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)



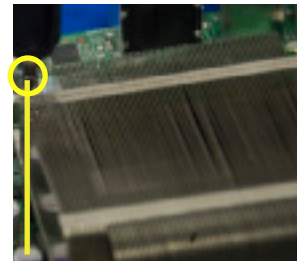

4. Finish the installation by fully tightening all four screws.



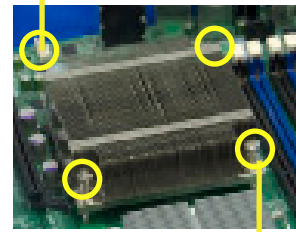
### *Removing the Heatsink*

**Warning:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to remove the heatsink, please follow the instructions below to uninstall the heatsink and prevent damage to the CPU or other components.

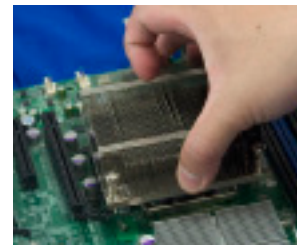
1. Unplug the power cord from the power supply.
2. Disconnect the heatsink fan wires from the CPU fan header.
3. Using a screwdriver, loosen and remove the heatsink screws from the motherboard in the sequence as show in the picture on the right.
4. Hold the heatsink as shown in the picture on the right and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink.)
5. Once the heatsink is loosened, remove it from the CPU socket.
6. To reinstall the CPU and the heatsink, clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before reinstalling them on the motherboard.



Using a screwdriver to remove Screw#1



Remove Screw#2



## 2-5 Memory Installation

**Note**: Check the Supermicro web site for recommended memory modules.

***CAUTION***

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance.

### DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM 1A. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below. (See the Memory Installation Table Below.)

2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

**Memory Population for Optimal Performance -For a motherboard with One CPU (CPU1) installed**

| | Branch 0 | | Branch 1 | | Branch 2 | |
|---|---|---|---|---|---|---|
| 3 DIMMs | P1 DIMM1A | | P1 DIMM2A | | P1 DIMM3A | |
| 6 DIMMs | P1 DIMM1A | P1 DIMM1B | P1 DIMM2A | P1 DIMM2B | P1 DIMM3A | P1 DIMM3B |

**Memory Population for Optimal Performance -For a motherboard with One CPU (CPU2) installed**

| | Branch 0 | | Branch 1 | | Branch 2 | |
|---|---|---|---|---|---|---|
| 3 DIMMs | P2 DIMM1A | | P2 DIMM2A | | P2 DIMM3A | |
| 6 DIMMs | P2 DIMM1A | P2 DIMM1B | P2 DIMM2A | P2 DIMM2B | P2 DIMM3A | P2 DIMM3B |

**Memory Population for Optimal Performance -For a motherboard with Two CPUs installed**

| | CPU1 | | | | | | CPU2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Branch 0 | | Branch 1 | | Branch 3 | | Branch 0 | | Branch 1 | | Branch 3 | |
| 6 DIMMs | 1A | | 2A | | 3A | | 1A | | 2A | | 3A | |
| 12 DIMMs | 1A | 1B | 2A | 2B | 3A | 3B | 1A | 1B | 2A | 2B | 3A | 3B |

### *Memory Support*

The X8DTU/X8DTU-F supports up to 192 GB* Registered ECC or up to 48 GB of Unbuffered ECC/Non-ECC DDR3 1333 MHz/1066 MHz/800 MHz in 12 DIMMs. (Refer to our website at www.supermicro.com for the recommended memory list.

### *Memory Support for the Motherboard with the 5500 Processor(s) Installed*

| RDIMM Population for the Motherboard w/5500 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Reg.= Registered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Reg. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 1 | Reg. DDR3 ECC | 800,1066 | QR |
| 3 | 2 | Reg. DDR3 ECC | 800,1066 | Mixing SR, DR |
| 3 | 2 | Reg. DDR3 ECC | 800 **(Note )** | Mixing SR, DR, QR |
| **Note:** 1066 RDIMMs will run at 800 MHz (-BIOS automatic downgrading) | | | | |

| UDIMM Population for the Motherboard w/5500 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Unb.= Unbuffered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Unb. DDR3 ECC/Non-ECC | 800,1066,1333 | SR or DR |
| 3 | 2 | Unb. DDR3 ECC/Non-ECC | 800,1066 | Mixing SR, DR |

### *Memory Support for the Motherboard with the 5600 Processor(s) Installed*

- 1.5V DIMMs

| 1.5V RDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Reg.=Registered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Reg. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 1 | Reg. DDR3 ECC | 800,1066 (Note 1) | QR |
| 3 | 2 | Reg. DDR3 ECC | 800,1066, 1333 | Mixing SR, DR |
| 3 | 2 | Reg. DDR3 ECC | 800 (Note 2) | Mixing SR, DR, QR |
| **Note 1:** 1333 MHz RDIMMs will run at 1066 MHz (-BIOS automatic downgrading).<br>**Note 2:** 1333/1066 MHz RDIMMs will run at 800 MHz (-BIOS automatic downgrading). | | | | |

| 1.5V UDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Unb.= Unbuffered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Unb. DDR3 ECC/Non-ECC | 800,1066,1333 | SR or DR |
| 3 | 2 | Unb. DDR3 ECC/Non-ECC | 800,1066, 1333 | Mixing SR, DR |
| **Note 1:** 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used.<br>**Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended. | | | | |

- 1.35V DIMMs

| 1.35V RDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Reg.=Registered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Reg. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 1 | Reg. DDR3 ECC | 800 (Note 1) | QR |
| 3 | 2 | Reg. DDR3 ECC | 800,1066 (Note 2) | Mixing SR, DR |
| 3 | 2 | Reg. DDR3 ECC | 800 (Note 3) | Mixing SR, DR, QR |
| **Note 1:** 1333/1066 MHz QR RDIMMs will run at 800 MHz (-BIOS automatic downgrading).<br>**Note 2:** 1333 MHz SR/DR RDIMMs will run at 800 MHz (-BIOS automatic downgrading).<br>**Note 3:** 1333/1066 MHz SR/DR/QR RDIMMs will run at 800 MHz (-BIOS automatic downgrading) | | | | |

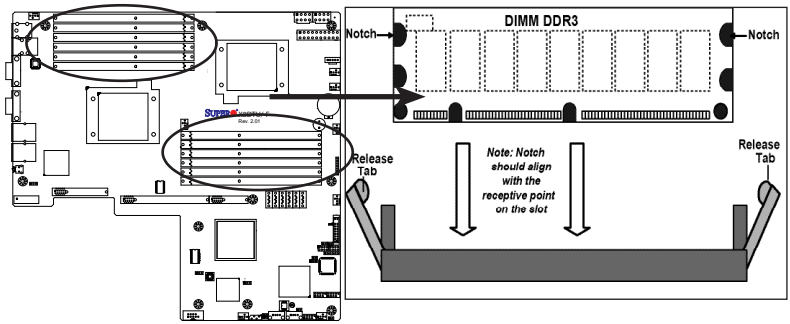
| 1.35V UDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Unb.= Unbuffered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Unb. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 2 | Unb. DDR3 ECC | 800,1066 | Mixing SR, DR |
| **Note 1:** 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used.<br>**Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended. | | | | |

**Note 1**: Memory speed support depends on the type of CPU used.

**Note 2**: Due to OS limitations, some operating systems may not show more than 4 GB of memory. Also, due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional.

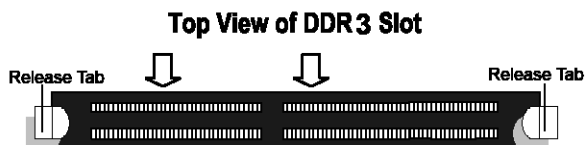
| Possible System Memory Allocation & Availability | | |
|---|---|---|
| System Device | Size | Physical Memory Remaining (-Available) (4 GB Total System Memory) |
| Firmware Hub flash memory (System BIOS) | 1 MB | 3.99 GB |
| Local APIC | 4 KB | 3.99 GB |
| Area Reserved for the chipset | 2 MB | 3.99 GB |
| I/O APIC (4 Kbytes) | 4 KB | 3.99 GB |
| PCI Enumeration Area 1 | 256 MB | 3.76 GB |
| PCI Express (256 MB) | 256 MB | 3.51 GB |
| PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary- | 512 MB | 3.01 GB |
| VGA Memory | 16 MB | 2.85 GB |
| TSEG | 1 MB | 2.84 GB |
| Memory available for the OS & other applications | | 2.84 GB |

## Installing and Removing DIMMs




**To Install:** Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

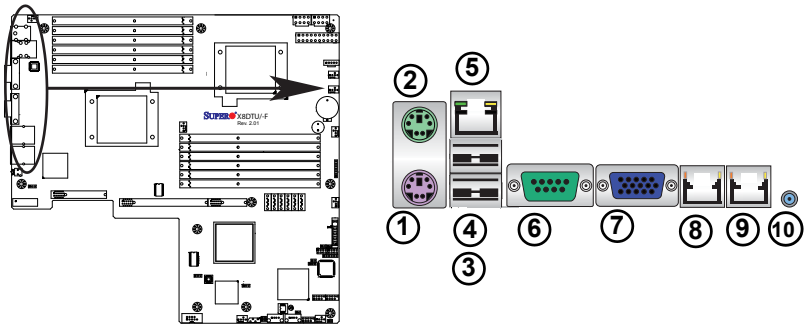
**To Remove:**
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



## 2-6 Control Panel Connectors/IO Ports

The I/O ports are color coded in conformance with the PC 99 specification. See the picture below for the colors and locations of the various I/O ports.

### Back Panel Connectors/IO Ports




**Back Panel I/O Port Locations and Definitions**

**Back Panel Connectors**

| | |
|---|---|
| 1. | Keyboard (Purple) |
| 2. | PS/2 Mouse (Green) |
| 3. | Back Panel USB Port 0 |
| 4. | Back Panel USB Port 1 |
| 5. | IPMI_Dedicated LAN (X8DTU-F) |
| 6. | COM Port 1 (Turquoise) |
| 7. | VGA (Blue) |
| 8. | Gigabit LAN 1 |
| 9. | Gigabit LAN 2 |
| 10. | UID Switch |

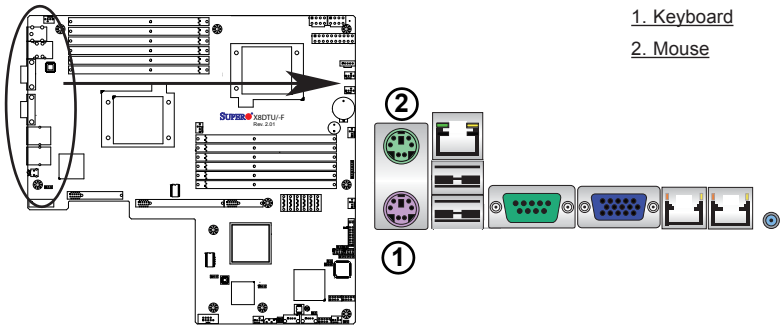
(See Section 2-5 for details.)

## Back Panel IO & USB Pin Definitions

### ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 are located next to the Backpanel USB ports 0/1 on the motherboard. See the table at right for pin definitions.

| PS/2 Keyboard/Mouse Pin Definitions | | | |
|---|---|---|---|
| PS2 Keyboard | | PS2 Mouse | |
| Pin# | Definition | Pin# | Definition |
| 1 | KB Data | 1 | Mouse Data |
| 2 | No Connection | 2 | No Connection |
| 3 | Ground | 3 | Ground |
| 4 | Mouse/KB VCC (+5V) | 4 | Mouse/KB VCC (+5V) |
| 5 | KB Clock | 5 | Mouse Clock |
| 6 | No Connection | 6 | No Connection |
| VCC: with 1.5A PTC (current limit) | | | |




1. Keyboard
2. Mouse

### Universal Serial Bus (USB)

There are eight USB 2.0 (Universal Serial Bus) connections on the motherboard. Backpanel USB Ports 0/1 are located next to Keyboard/ Mouse Connectors. USB 2/3 (J11), USB 4/5 (J12), USB 6 (J13) and USB 7 (J14) are front panel USB connections used to provide front panel USB access. See the tables on the right for pin definitions.

**Back Panel USB (USB 0/1)**

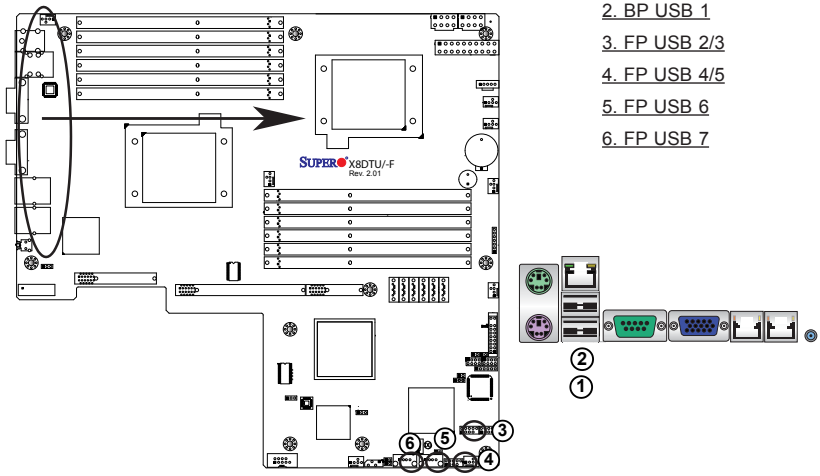
| Pin# | Definitions |
|---|---|
| 1 | +5V |
| 2 | PO- |
| 3 | PO+ |
| 4 | Ground |
| 5 | N/A |

**Front Panel USB (USB 6/7)**

| Pin# | Definition |
|---|---|
| 1 | Vcc |
| 2 | Data- |
| 3 | Data+ |
| 4 | Ground |
| 5 | NA |

**Front Panel USB Pin Definitions (USB 2/3/4/5)**

| USB2/4 Pin # | USB2/4 Definition | USB3/5 Pin # | USB3/5 Definition |
|---|---|---|---|
| 1 | +5V | 1 | +5V |
| 2 | PO- | 2 | PO- |
| 3 | PO+ | 3 | PO+ |
| 4 | Ground | 4 | Ground |
| 5 | Key | 5 | No connection |




1. BP USB 0
2. BP USB 1
3. FP USB 2/3
4. FP USB 4/5
5. FP USB 6
6. FP USB 7

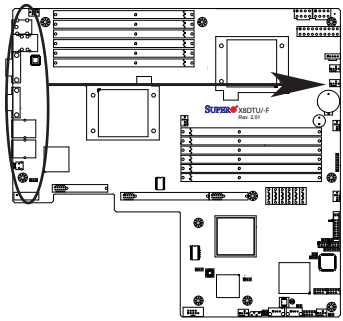
### Gigabit LAN (Ethernet) Ports

Two Gigabit Ethernet ports (LAN1/2) are located next to the VGA port on the IO backplane. Additionally, an IPMI_Dedicated_LAN with full KVM support is located above the USB Ports 1/2 on the X8DTU-F. These ports accept RJ45 type cables. (**Note**: Please refer to the LED Indicator Section for GLAN LED information.)

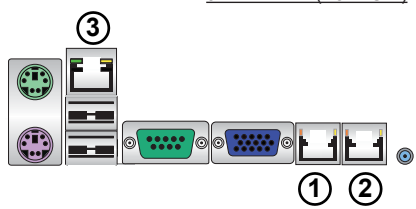
**GLAN Ports Pin Definition**

| Pin# | Definition | | |
|---|---|---|---|
| 9 | P2V5SB | 18 | SGND |
| 10 | TD0+ | 19 | Act LED |
| 11 | TD0- | 20 | P3V3SB |
| 12 | TD1+ | 21 | Link 100 LED (Yellow, +3V3SB) |
| 13 | TD1- | 22 | Link 1000 LED (Yellow, +3V3SB) |
| 14 | TD2+ | 23 | Ground |
| 15 | TD2- | 24 | Ground |
| 16 | TD3+ | 27 | Ground |
| 17 | TD3- | 28 | Ground |

(NC: No Connection)



1. LAN 1
2. LAN 2
3. IPMI-LAN (X8DTU-F)



### Serial Ports

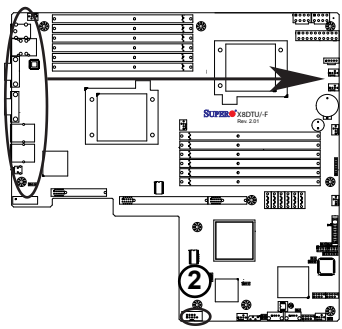
Two COM connections (COM1 & COM2) are located on the motherboard. COM1 is located next to the Video port on the Backplane IO panel. COM2 (JCOM2) is located next to the BMC Controller to provide front accessible serial connection. See the table on the right for pin definitions.

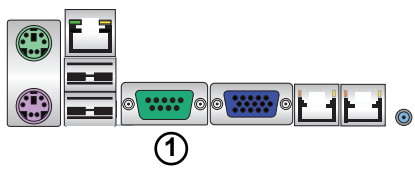
**Serial Ports-COM1 Pin Definitions**

| Pin # | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | DCD | 6 | DSR |
| 2 | RXD | 7 | RTS |
| 3 | TXD | 8 | CTS |
| 4 | DTR | 9 | RI |
| 5 | Ground | 10 | N/A |

**Serial Ports-COM2 Pin Definitions**

| Pin # | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | DCD | 6 | DSR |
| 2 | RXD | 7 | RTS |
| 3 | TXD | 8 | CTS |
| 4 | DTR | 9 | RI |
| 5 | Ground | 10 | Key |



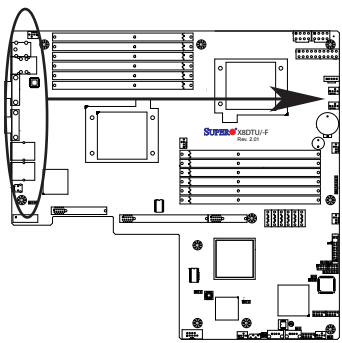




1. COM 1
2. COM 2

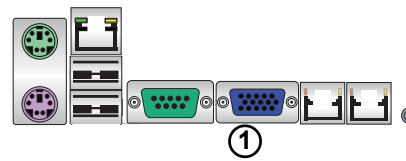
### VGA Connector

A VGA connector is located next to COM Port1 on the IO backplane. This connector provides video and CRT display. Refer to the board layout below for the location.

| VGA/CRT Pin Definitions | | | |
|---|---|---|---|
| Pin# | Definition | Pin# | Definition |
| 1 | Red | 10 | Ground |
| 2 | Green | 11 | MS0 |
| 3 | Blue | 12 | MS1: SDA (DDC Data) |
| 4 | MS2 | 13 | HSYNC |
| 5 | Ground | 14 | VSYSNC |
| 6 | Ground | 15 | MS3: SCL (DDC CLK) |
| 7 | Ground | 16 | Case |
| 8 | Ground | 17 | Case |
| 9 | NC | | |
| NC= No Connection | | | |



1. VGA



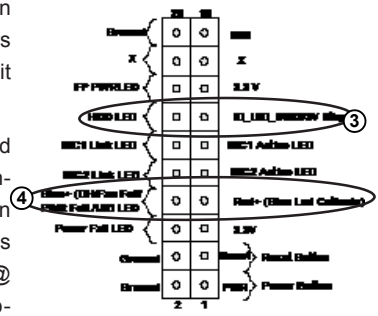
### Unit Identifier Switches

Two Unit Identifier (UID) Switches and two LED Indicators are located on the motherboard. The Rear UID Switch (JUID) is located next to LAN 2 port on the backplane. The Front Panel UID Switch is located at Pin 13 of the Front Control Panel. Connect a cable to Pins 13/14 of JF1 for Front Panel UID Switch support. The Front Panel UID LED is located at Pin 7 of JF1, and the Rear UID LED is located at LE2. When you press the front or rear UID switch, both Rear UID LED and Front Panel UID LED Indicators will be turned on. Press the UID switch again to turn off both LED Indicators. These UID Indicators provide easy identification of a system unit that may be in need of service.

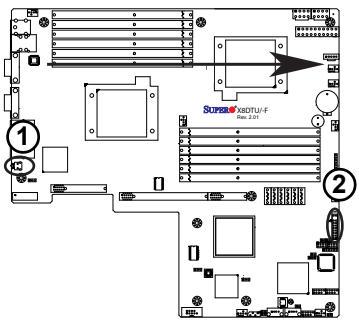
**Note:** UID can also be triggered via IPMI on the X8DTU-F motherboard. For more information on IPMI, please refer to the IPMI User's Guide posted on our website @ http://www.supermicro.com/support/manuals/.

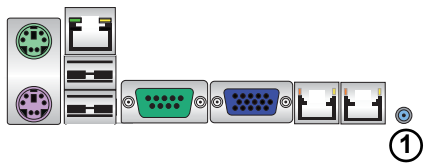
| UID Switch | |
|---|---|
| Pin# | Definition |
| 1 | Ground |
| 2 | Ground |
| 3 | Button In |
| 4 | Ground |

| UID LED (LED 2) Status | | |
|---|---|---|
| Color/State | OS | Status |
| Blue: On | Windows OS | Unit Identified |
| Blue: Blinking | Linux OS | Unit Identified |




1. Rear UID Switch & LED
2. Front Control Panel
3. Front UID Switch
4. Front UID LED

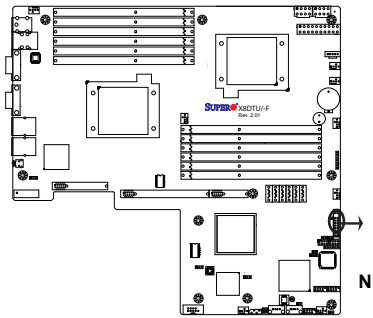


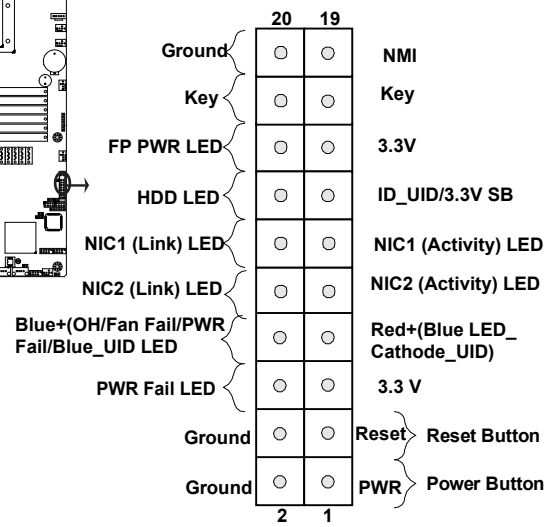



## Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

**JF1 Header Pins**





## Front Control Panel Pin Definitions

### NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

| NMI Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 19 | Control |
| 20 | Ground |

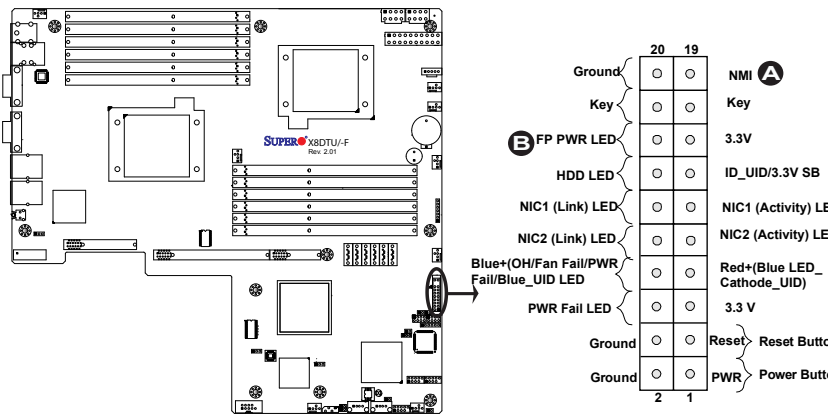
### Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

| Power LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 15 | +5V |
| 16 | Ground |

A. NMI

B. PWR LED



### HDD LED/UID Switch

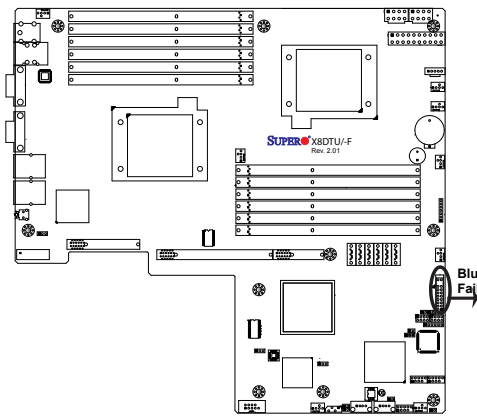
The HDD/UID LED connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable here to display disk activity status (for any hard drive activities on the system, including Serial ATA activities). Connect a UID switch cable to use UID switch connection. The front UID switch works in conjunction with UID LED located at Pins 7/8. Refer to Page 2-18 for more UID switch/LED information. See the table on the right for pin definitions.

| HDD LED/UID Switch Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 13 | UID Switch/3,3V |
| 14 | HDD Active |

### NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for GLAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for GLAN Port 2 is on Pins 9 and 10. Attach the NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

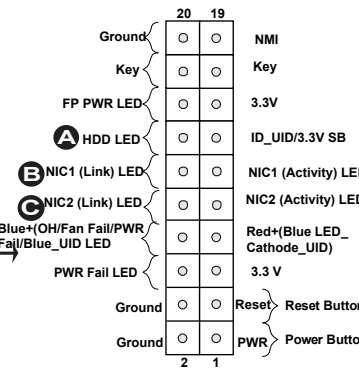
| GLAN1/2 LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 9/11 | NIC Activity |
| 10/12 | NIC Link |




A. HDD LED/UID Switch

B. NIC1 LED

C. NIC2 LED



### Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED cable to pins 7 and 8 of JF1 to use the Overheat/Fan Fail/Power Fail and UID LED connections. The Red LED on pin 7 provides warnings of an overheat, fan failure or power failure. The Blue LED on pin 8 works as the front panel UID LED indicator. The Red LED takes precedence over the Blue LED by default. Refer to the table on the right for pin definitions.

**OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 7 | Blue_LED Cathode (UID) |
| 8 | OH/Fan Fail/PWR Fail/UID LED |

**OH/Fan Fail/PWR Fail LED Status**

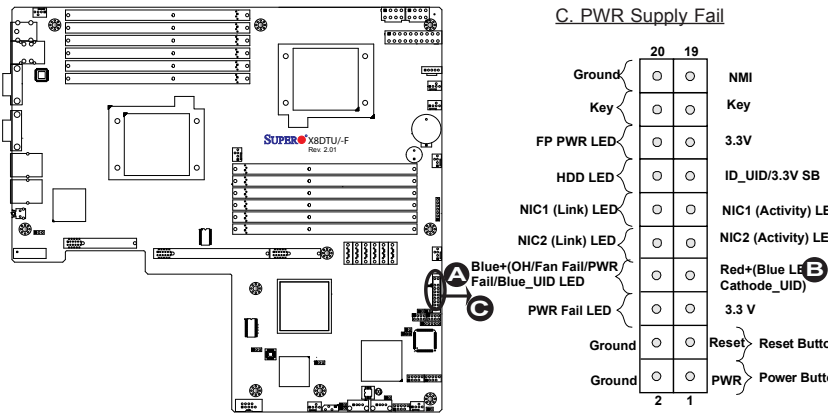
| Pin 7 | Pin 8 | Red LED | Blue LED |
|---|---|---|---|
| Low | High | On: OH/FF/PWR Fail (Solid On: OH Fast Blinking: Fan Fail Slow Blinking: PWR Fail) | Off |
| High | Low | Off (System: Normal) | On UID LED |
| High | High | Off | Off |

### Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

**PWR Fail LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 5 | 3.3V |
| 6 | PWR Fail LED |



### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

| Reset Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 3 | Reset |
| 4 | Ground |

### Power Button

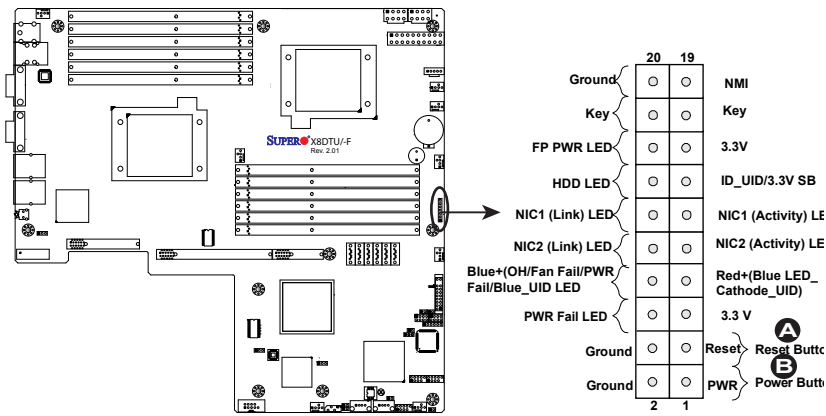
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button works in conjunction with the Power-Off setting in the BIOS Advanced submenu. Refer to the tables on the right for pin definitions.

| Power Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 1 | Signal |
| 2 | +3V Standby |

| Power Button Power On/Off Settings | |
|---|---|
| PWR_Off Setting in the BIOS: | PWR Activity on the motherboard: |
| When PWR_Off is set to Instant_Off | To power-on: Power is turned on immediately<br>To pwer-off: PWR is turned off immediately |
| When PWR_Off is set to 4_second suspend | To power-on: Power is turned on immediately<br>To pwer-off: Short both pins for 4 seconds or longer to turn off the power. |

A. Reset Button

B. PWR Button



# 2-7 Connecting Cables

### ATX Power Connector

There are a 20-pin main power supply connector(JPW1) and two 8-pin CPU PWR connectors (JPW2/JPW3) on the motherboard. These power connectors meet the SSI EPS 12V specification.

**20-pin Main Power Connector Pin Definitions**

| Pin# | Definition | Wire Color | Pin # | Definition | Wire Color |
|---|---|---|---|---|---|
| 1 | +3.3Vdc | Orange | 11 | +3.3Vdc | Orange |
| 2 | +3.3Vdc | Orange | 12 | -12Vdc | Blue |
| 3 | Ground | Black | 13 | Ground | Black |
| 4 | +5Vdc | Red | 14 | PS-On | Green |
| 5 | Ground | Black | 15 | Ground | Black |
| 6 | +5Vdc | Red | 16 | Ground | Black |
| 7 | Ground | Black | 17 | Ground | Black |
| 8 | PWR_OK | Gray | 18 | -5Vdc | White |
| 9 | +5Vdc VSB Standby Voltage | Purple | 19 | +5Vdc | Red |
| 10 | +12Vdc | Yellow | 20 | +5Vdc | Red |

### Processor Power Connector

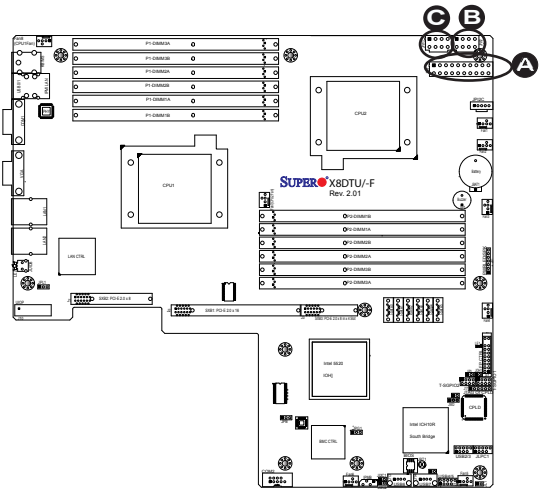
In addition to the Primary ATX power connector, the 12V 8-pin CPU PWR connectors at JPW2/JPW3 must also be connected to your power supply. See the table on the right for pin definitions.

**12V 8-pin Power Connector Pin Definitions**

| Pins | Definition |
|---|---|
| 1 through 4 | Ground |
| 5 through 8 | +12V |

**(Required)**

**Warning**: To prevent damage to your power supply or motherboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these power connectors to the 20-pin and the two 8-pin power connectors on your motherboard for adequate power supply to your system. Failure to do so will void the manufacturer warranty on your power supply and motherboard.




A. 20-pin ATX PWR
B/C.8-pin Processor PWR
(Required)

### UIO Riser_Card Power Connector

In addition to the Primary 20-pin power connector and the 8-pin CPU PWR connectors, the Universal IO Power Connector (UIOP) located at J10 is also required for the riser cards installed on the motherboard. This power connector is used to provide power to the riser card. See the table on the right for pin definitions.

**Universal IO PWR Connector Pin Definitions**

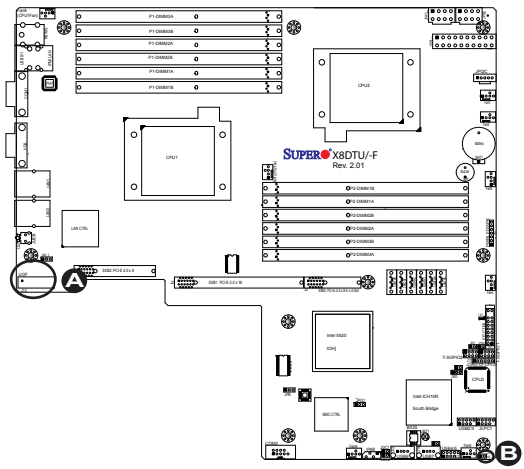
| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| B1 | P5V | A1 | P3V3 |
| B2 | P5V | A2 | P3V3 |
| B3 | P5V | A3 | P3V3 |
| B4 | P5V | A4 | P3V3 |
| B5 | P5V | A5 | P3V3 |
| B6 | P5V | A6 | P3V3 |
| B7 | P5V | A7 | P3V3 |
| B8 | P5V | A8 | P3V3 |
| B9 | P5V | A9 | P3V3 |
| B10 | P5V | A10 | P3V3 |
| B11 | N12V | A11 | P3V3 |
| B12 | P3V3 STBY | A12 | P3V3 |
| B13 | P3V3 STBY | A13 | P12V |
| B14 | Ground | A14 | P12V |
| B15 | Ground | A15 | P12V |
| B16 | Ground | A16 | P12V |
| B17 | Ground | A17 | P12V |
| B18 | Ground | A18 | Ground |

### Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

**Chassis Intrusion Pin Definitions (JL1)**

| Pin# | Definition |
|---|---|
| 1 | Intrusion Input |
| 2 | Ground |




A. UIO PWR Connector

B. Chassis Intrusion

### Fan Headers

The X8DTU/X8DTU-F has six chassis/system fan headers (Fan1 to Fan6) and two CPU fans (Fan7/Fan8) on the motherboard. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by a Hardware Monitoring setting in the BIOS. (The Default setting is Disabled.) See the table on the right for pin definitions.

**Fan Header Pin Definitions**

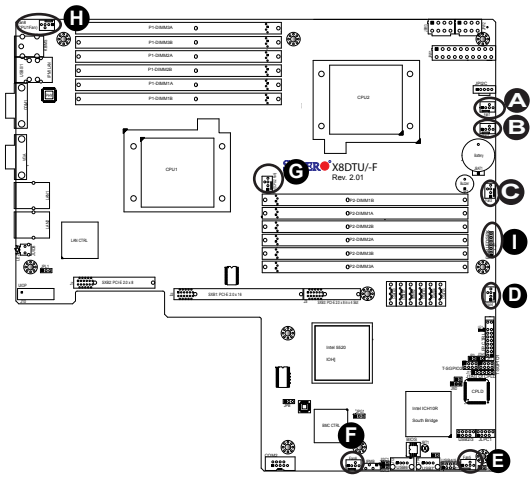
| Pin# | Definition |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Tachometer |
| 4 | PWR Modulation |

### Speaker/Power LED Header

On the JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. Please note that the speaker connector pins (4-7) are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

**Speaker/Power LED Connector**

| Pin Setting | Definition |
|---|---|
| Pins 6-7 | Internal Speaker |
| Pins 4-7 | External Speaker |




A. Fan 1
B. Fan 2
C. Fan 3
D. Fan 4
E. Fan 5
F. Fan 6
G. Fan 7 (CPU1 Fan)
H. Fan 8 (CPU2 Fan)
I. PWR LED/Speaker

### T-SGPIO Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers (T-SGPIO-1/T-SGPIO-2) are located at below the front panel control connector (JF1) on the motherboard. These headers support serial link interfaces for the onboard SATA connectors. See the table on the right for pin definitions. Refer to the board layout below for the location.

**T-SGPIO Pin Definitions**

| Pin# | Definition | Pin | Definition |
|---|---|---|---|
| 1 | NC | 2 | NC |
| 3 | Ground | 4 | Data |
| 5 | Load | 6 | Ground |
| 7 | Clock | 8 | NC |

**Note:** NC= No Connections

### Overheat LED/Fan Fail (JOH1)

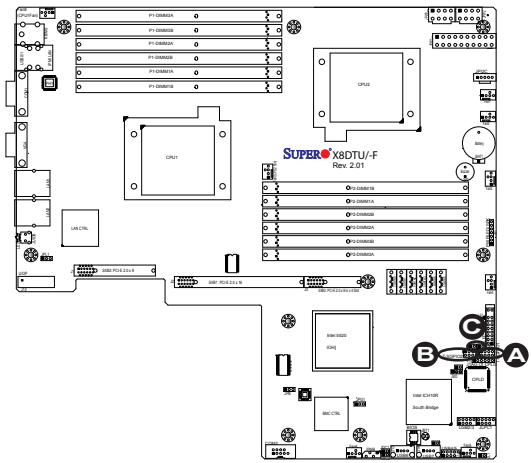
The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating or fan failure. This LED will blink when a fan failure occurs. Refer to the table on right for pin definitions.

**Overheat LED Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | 5vDC |
| 2 | OH Active |

**OH/Fan Fail LED Pin Definitions**

| State | Message |
|---|---|
| Solid | Overheat |
| Blinking | Fan Fail |




A. T-SGPIO1
B. A. T-SGPIO2
C. Overheat/Fan Fail LED (JOH1)

### Power SMB (I²C) Connector

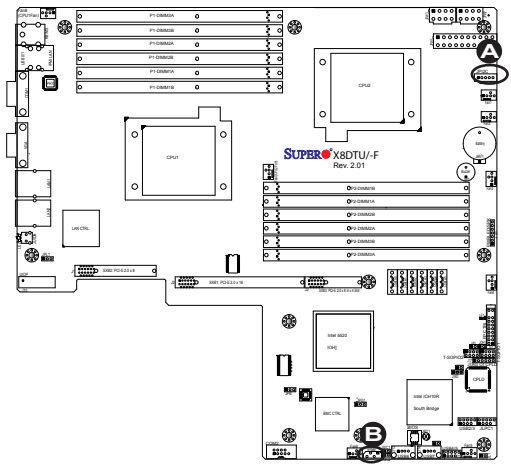
Power System Management Bus (I²C) Connector (JPI²C) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

| PWR SMB Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Clock |
| 2 | Data |
| 3 | PWR Fail |
| 4 | Ground |
| 5 | +3.3V |

### IPMB I²C SMB (X8DTU-F)

A System Management Bus header for the IPMI slot is located at IPMB. Connect the appropriate cable here to use the IPMB I²C connection on your system.

| SMB Header Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Data |
| 2 | Ground |
| 3 | Clock |
| 4 | No Connection |



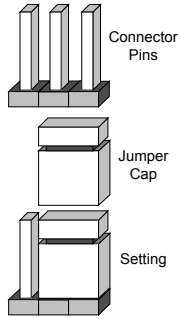

A. PWR SMB

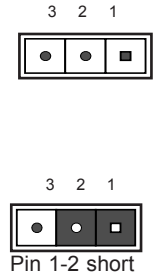
B. IPMB SMB

# 2-8 Jumper Settings

## Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.



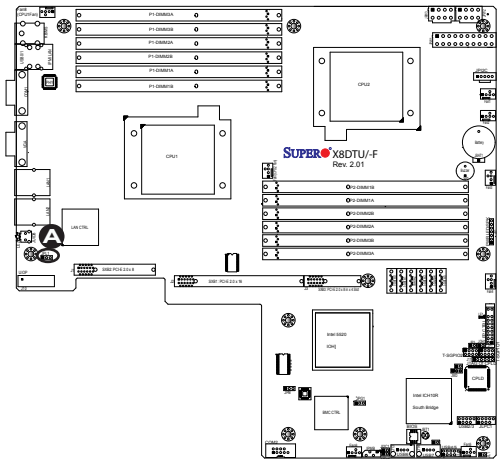




**Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

### GLAN Enable/Disable

JPL1 enable or disable the GLAN Port1/GLAN Port2 on the motherboard. See the table on the right for jumper settings. The default setting is **Enabled.**

| GLAN Enable Jumper Settings | |
|---|---|
| Pin# | Definition |
| 1-2 | Enabled (default) |
| 2-3 | Disabled |




A. LAN Ports 1/2 Enable

### CMOS Clear

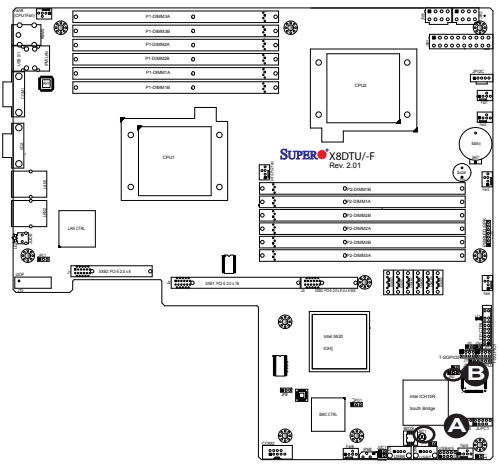
JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

**Note:** For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS.

### Watch Dog Enable/Disable

Watch Dog (JWD) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

| Watch Dog Jumper Settings (JWD) | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | Reset (default) |
| Pins 2-3 | NMI |
| Open | Disabled |




A. Clear CMOS

B. Watch Dog Enable

### I²C Bus to PCI-Exp. Slots

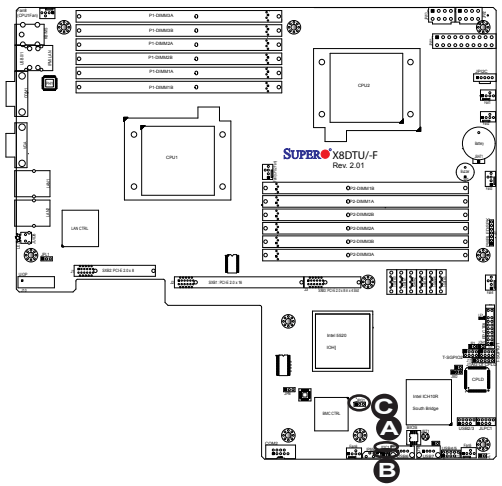
Jumpers JI²C1 and JI²C2 allow you to connect the System Management Bus (I²C) to PCI-Express slots. The default setting is Open to disable the connection. See the table on the right for jumper settings.

| I²C to PCI-Exp Jumper Settings | |
|---|---|
| Jumper | Definition |
| Closed | Enabled |
| Open | Disabled (Default) |

### VGA Enable

JPG1 allows you to enable or disable the onboard VGA connection. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

| VGA Enable/Disable Jumper Settings (JPG1) | |
|---|---|
| Both Jumpers | Definition |
| Pins 1-2 | Enabled |
| Pins 2-3 | Disabled |

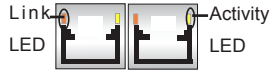



A. JI²C1
B. JI²C2
C. VGA Enabled

## 2-9 Onboard Indicators

### GLAN LEDs

There are two GLAN ports (LAN1/LAN2) on the motherboard. Each Gigabit Ethernet LAN port has two LEDs. The yellow LED (Right) indicates activity, while the Link LED (Left) may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.




**Rear View** (when facing the rear side of the chassis)

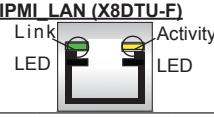
| GLAN Activity Indicator LED Settings (Right) | | |
|---|---|---|
| Color | Status | Definition |
| Yellow | Blinking | Active |

| GLAN Link Indicator LED Settings (Left) | |
|---|---|
| LED Color | Definition |
| Off | No Connection or 10 Mbps |
| Green | 100 Mbps |
| Amber | 1 Gbps |

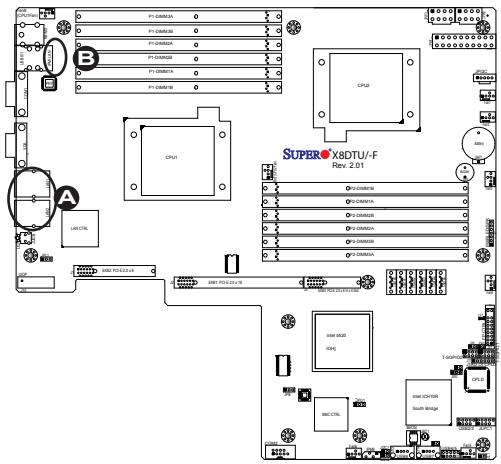
### IPMI_Dedicated LAN LEDs (X8DTU-F)

In addition to LAN1 and LAN2, the X8DTU-F has an IPMI_Dedicated LAN located on the IO Backpanel. The yellow LED (Right) indicates activity; the green LED on the left indicates the connection and the speed. See the tables at right for more information.

**IPMI_LAN (X8DTU-F)**




| IPMI LAN LED Indicator LED Settings | | |
|---|---|---|
| | Color/State | Definition |
| Activity (Right) | Yellow: Blinking | Active |
| Link (Left) | Green: Solid On<br>Off | 100 Mbps<br>Not connected |




A.LAN 1/2 LEDs

B. IPMI_LAN LED

### Onboard Power LED

An Onboard Power LED is located at LE1 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

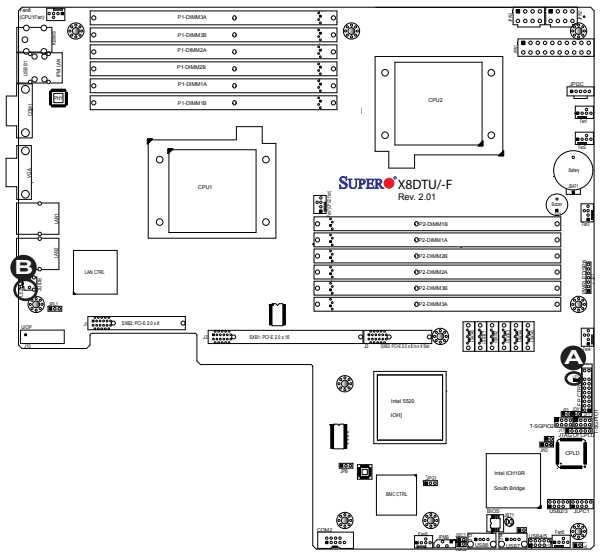
| Onboard PWR LED Indicator (LE1) LED Settings | |
|---|---|
| LED Color | Definition |
| Off | System Off (PWR cable not connected) |
| Green | System On |
| Green: Flashing Quickly | ACPI S1 State |
| Green: Flashing Slowly | ACPI S3 (STR) State |

### Rear UID LED

A Rear Unit Identifier LED (LE2) is located on the backpanel on the motherboard. This LED works in conjunction with the Rear UID Switch to provide easy identification of a unit that might be in need of service. Please refer to the Rear UID Switch in Section 2-4 for more information.

A. Onboard Power LED

B. Rear UID LED



# 2-10 Serial ATA and PCI-E Connections

### Serial ATA Ports

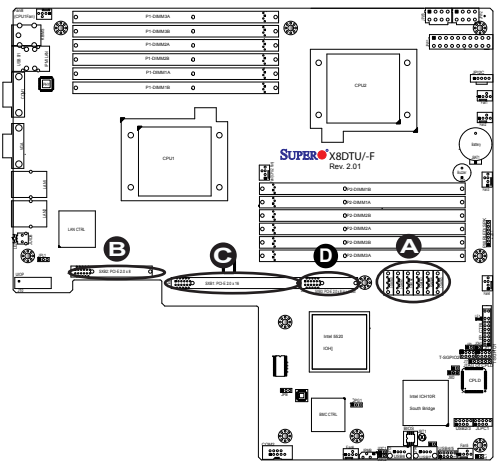
Six Serial ATA Ports (I-SATA0~I-SATA 5) are located at JS1~JS6 on the motherboard. These ports provide serial-link signal transmission, which is faster than that of the traditional Parallel ATA. See the table on the right for pin definitions.

**Serial ATA Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | Ground |
| 2 | TX_P |
| 3 | TX_N |
| 4 | Ground |
| 5 | RX_N |
| 6 | RX_P |
| 7 | Ground |

### PCI-Express Gen. 2 Slots

Three PCI-Express (Gen. 2) Slots are located at SXB1/SXB2/ SXB3 (J1~J3) on the motherboard. Refer to the layout below for the InfiniBand Connector location.




A. I-SATA0~5

B.J1: SXB1: PCI-E 2.0 x 8

C. J2: SXB2: PCI-E 2.0 x 16

D. J3: SXBE: PCI-E 2.0 x 8 in x4

# Chapter 3

# Troubleshooting

## 3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Note: Always disconnect the power cord before adding, changing or installing any hardware components.

### Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse. Also, be sure to remove all add-on cards.
3. Install CPU 1 first (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)

### No Power

1. Make sure that no short circuits between the motherboard and the chassis.
2. Make sure that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

### No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.

2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

### Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-5 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

### Memory Errors

When a memory error beep code is issued, check the following:

1. Make sure that the DIMM modules are properly and fully installed.

2. Check if different speeds of DIMMs have been installed. It is strongly recommended to use the same RAM speed for all DIMMs in the system.

3. Make sure you are using the correct type of DDR3 Registered ECC or Unbuffered ECC/Non-ECC 1333 MHz/1066 MHz/800 MHz SDRAM (recommended by the manufacturer.)

4. Check for bad DIMM modules or slots by swapping a single module between all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Make sure to follow the instructions given in Section 2-5 in Chapter 2.

6. Check the position of the 115V/230V switch on the power supply.

7. Please follow the instructions given in the DIMM Population Tables listed on Pages 2-7 and 2-8 to install your memory modules.

## 3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro does not sell directly to end-

users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our Web site (http://www.supermicro.com/support/faqs/) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our web site at (http://www.supermicro.com/support/bios/).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number
- BIOS release date/version (this can be seen on the initial display when your system first boots up)
- System configuration
- An example of a Technical Support form is on our web site at (http://www.supermicro.com/support/contact.cfm).
- Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com or by fax at: (408) 503-8000, option 2.

## 3-3 Frequently Asked Questions

**Question: What are the various types of memory that my motherboard can support?**

**Answer:** The X8DTU/X8DTU-F has 12 240-pin DIMM slots that support DDR3 Registered ECC or Unbuffered ECC/Non-ECC 1333 MHz/1066 MHz/800 MHz SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes. Refer to Section 2-5 in Chapter 2 for details.

**Question: How do I update my BIOS?**

**Answer:** It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com/support/bios/. Please check our BIOS warning message and the information on how to update your BIOS on our Web

site. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision and make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format flash.bat filename.rom from your a bootable USB device to flash the BIOS. Then, your system will automatically reboot. Please note that this process may take a few minutes to complete. Do not be concerned if the screen is paused for a few minutes.

**Warning**: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!)

**Note**: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to Supermicro for repair.

**Question: What's on the CD that came with my motherboard?**

**Answer:** The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for the Windows OS, security and audio drivers.

**Question: How do I handle the used battery?**

**Answer:** Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

## 3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. You can also request a RMA authorization online (http://www.supermicro.com/support/rma/). When returning the motherboard to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

# Chapter 4

# BIOS

## 4-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTU/X8DTU-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

### Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

**Note**: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

**Note**: Options printed in **Bold** are default settings.

### How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

**Note**: For AMI BIOS Recovery, please refer to the AMI BIOS Recovery Instructions posted on our website at http://www.supermicro.com/support/manuals/.

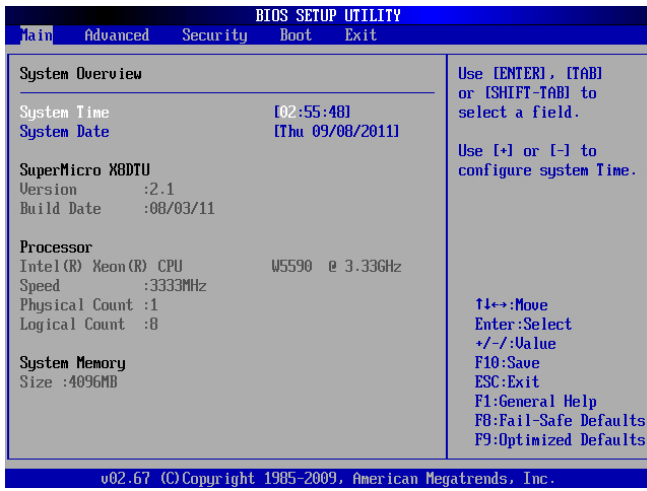
### Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

**Warning!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

## 4-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.




**System Overview:** The following BIOS information will display:

#### System Time/System Date

These items display the system time and date. Highlight *System Time* or *System Date* using the arrow keys. The date is displayed in Day MM/DD/YY format. The time is displayed in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

**SuperMicro X8DTU**

- **Version**: This item displays the BIOS revision used in your system.
- **Build Date**: This item displays the date when this BIOS was completed.

**Processor**

The AMI BIOS will automatically display the status of the processor used in your system:

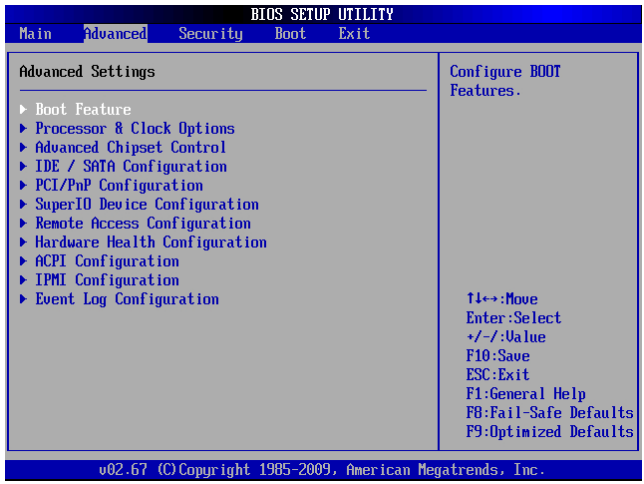
- **CPU Type**: This item displays the type of processors used in the motherboard.
- **Speed**: This item displays the speed of the processor(s) detected by the BIOS.
- **Physical Count**: This item displays the number of processors installed in your system as detected by the BIOS.
- **Logical Count**: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

**System Memory**

This displays the size of memory available in the system:

## 4-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:




### ▶Boot Features

#### Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

#### Quiet Boot

This option allows the user to choose the bootup screen display between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

#### AddOn ROM Display Mode

This item sets the display mode for the Option ROM. The options are **Force BIOS** and Keep Current.

#### Bootup Num-Lock

Use this feature to select the power-on state for the Numlock key. The options are Off and **On**.

#### Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

**Hit 'Del' Message Display**

Select Enabled to display *Press DEL to run Setup* during POST. The options are **Enabled** and Disabled.

**Interrupt 19 Capture**

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

## Power Configuration

**Watch Dog Function**

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

**Power Button Function**

If set to Instant_Off, the system will power off immediately as soon as the user hits the power button. If set to 4_Second_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

**Restore on AC Power Loss**

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

## ▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

**CPU Ratio**

Select Manual to manually configure the ratio between the CPU Core Clock and the FSB Frequency. Select Auto to allow the BIOS to automatically configure the CPU Ratio. The options are **Auto** and Manual.

**Clock Spread Spectrum**

Select Enable to enable Clock Spread Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

**Hardware Prefetcher (Available when supported by the CPU)**

If set to Enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

**Adjacent Cache Line Prefetch (Available when supported by the CPU)**

The CPU prefetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

**DCU Prefetcher (Available when supported by the CPU)**

Select Enabled to activate Level 1 Data Prefetcher to enhance system performance. For better performance of your DP server, please refer to the specifications of your applications installed in your server to enable or disable this feature. The options are **Enabled** and Disabled.

**Data Reuse Optimization (Available when supported by the CPU)**

Select Enabled to maximize Data Reuse support to enhance system performance for DP platforms. For better performance of your DP server, please refer to the specifications of your applications installed in your server to enable or disable this feature. The options are **Enabled** and Disabled.

**MPS and ACPI MADT Ordering**

This feature allows the user to configure the MPS (Multi-Processor Specification) and ACPI settings for your motherboard. Select Modern Ordering if the XP or a newer version of Windows OS is used in the motherboard. Select Legacy Ordering if the 2000 or an earlier version of Windows OS is used. The options are **Modern Ordering** and Legacy Ordering.

**Intel® Virtualization Technology (Available when supported by the CPU)**

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

**Execute-Disable Bit Capability (Available when supported by the OS and the CPU)**

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

**Intel AES-NI (Available when supported by the OS and the CPU)**

If this feature is set to Enabled, Intel AES-NI will add new encryption features to help accelerate AES Software application, providing code authorization and signature verification to improve system performance. The default is **Disabled**. (Refer to Intel and Microsoft websites for more information.)

**Simultaneous Multi-Threading (Available when supported by the CPU)**

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

**Active Processor Cores**

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1, 2, 3, 4 and 5.

**Intel® EIST Technology**

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

**Intel® TurboMode Technology**

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

**C1E Support**

Select Enabled to use the feature of Enhanced Halt State. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

**Intel® C-STATE Tech**

If this item is set to Enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

**C-State Package Limit Setting**

If this item is set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

**C1 Auto Demotion**

When this item is set to Enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are **Disabled** and Enabled**.**

**C3 Auto Demotion**

When this item is set to Enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are **Disabled** and Enable**d.**

**ACPI T State**

Select Enabled to report processor throttling in ACPI (Advanced Configuration and Power Interface). The options are **Disabled** and Enabled.

## ▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

### ▶CPU Bridge Configuration

- **CPU Revision**: This item displays the CPU revision number.
- **Current QPI Frequency:** This item displays current QPI frequency.
- **Current Memory Frequency for CPU1/ CPU2:** This item displays current CPU memory frequency for CPU1/CPU2.
- **Memory Reference Code Rev.:** This item displays the revision number of the memory reference code.
- **QPI Reference Code Rev.:** This item displays the revision number of the QPI reference code for the motherboard.

**Request Transaction ID (Available for the Intel Xeon 5600 platform only)**

QuickPath Interconnect (QPI) is the connection between the CPUs and the I/O hubs (IOHs). For a transaction to be processed in the QPI, a "Transaction ID" is required, and it is assigned by an agent (CPU1, CPU2 or the IOH). Each agent is allocated a number of Transaction IDs based on the QPI IO bandwidth and the Request Transaction ID (RTID) setting (32-24-32 or 32-16-40). Once Transaction

IDs are allocated to an agent, it will assign a Transaction ID to an event so that it can be processed in the QPI. Select Balanced to allocate transaction IDs to an agent based on the setting 32-24-32. Select IO Bias to allocate RTIDs based on the setting 32-16-40. The options are **Balanced** and IO Bias.

**QPI Links Speed**

Use this feature to select the data transfer speed for QPI. The options are Slow-mode, and **Full-Speed**.

**QPI Frequency**

Use this feature to select the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

**QPI L0s and L1**

Select Enabled to set QPI power to a lower state. L0s and L1 are automatically selected by the motherboard. The options are Disabled and **Enabled**.

**Memory Frequency**

This feature forces a DDR3 frequency slower than what the system has detected to desired setting. The available options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333, and Force SPD (memory modules with Serial Presence Detect capability).

**Memory Mode**

Select Independent to make all DIMMs available to the operating system. Select Channel Mirroring to maintain two identical copies of all data in Channel 1 and Channel 2 memory modules for data security. Select Lockstep for the motherboard to use two areas of memory to run the same set of operations in parallel. Select Sparing for a preset threshold of correctable errors to be used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory. This option is supported by Intel 5600 Series processors only. The options are Independent, Channel Mirroring, and Lockstep.

**Demand Scrubbing**

This is a memory error-correction scheme that the processor writes corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

**Patrol Scrubbing**

This is the memory error-correction scheme that works in the background looking for and correcting resident errors. The options are **Enabled** and Disabled.

**Throttling - Closed Loop/Throttling - Open Loop**

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are Disabled and **Enabled**.

## ▶North Bridge Configuration

This feature allows the user to configure Intel IOH settings.

**NB Revision**

This item indicates the revision number of the Northbridge chipset.

**Intel I/OAT**

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for more other tasks. The options are Disabled and **Enabled**.

**DCA (Direct Cache Access) Technology**

This feature works in conjunction with the Intel I/O AT (Acceleration Technology) to accelerate the performance of the TOE device. When this feature set to Enabled, it will enhance overall system performance by providing direct cache access for data transferring. The options are **Enabled** and Disabled.

**DCA Prefetch Delay**

A DCA Prefetcher is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], [24], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], and [120].

**Intel VT-d**

Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The options are **Enabled** and Disabled.

**Active State Power-Management**

Select Enabled to use the power management for signal transactions between the PCI Express L0 and L1 Links. Select Enabled to configure PCI-Exp. L0 and L1 Link power states. The options are **Disabled** and Enabled.

**IOH PCI-E Max Payload Size**

Some add-on cards perform faster with coalesce, which limits the payload size to 128B; while others, with a payload size of 256B which inhibits coalesce support. Please refer to your add-on card user guide for the desired setting. The options are **256B** and 128B.

**Slot SXB2/SXB3 Width**

This feature allows the user to change the link width of a PCI slot as specified in order to support a riser or add-on card installed in the slot. The options are x4x4, **x8** and Auto.

**Slot SXB1 Width**

This feature allows the user to change the link width of a PCI slot as specified in order to support a riser or add-on card installed in the slot. The options are x4x4x4x4, x4x4x8, x8x4x4, **x8x8,** x16 and Auto.

## ▶SouthBridge Configuration

This feature allows the user to configure Intel ICH South Bridge settings.

**USB Functions**

This feature allows the user to enable or disable onboard USB support. The Options are: Disabled, and **Enabled**.

**Legacy USB Support**

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, **Enabled**, and Auto.

**Port60h/64h Emulation**

Select Enabled to enable 60h/64h emulation for complete USB keyboard support for operating systems that are not compatible with USB devices. The options are Enabled and **Disabled.**

**USB 2.0 Controller (Available when the item: USB Functions is disabled)**

This feature displays the current USB controller used in the motherboard.

**USB 2.0 Controller Mode**

This setting allows you to select the USB 2.0 Controller mode. The options are **Hi-Speed (480 Mbps**) and Full Speed (12 Mbps).

**BIOS EHCI Hand-Off**

Select Enabled to support BIOS Enhanced Host Controller Interface to provide a workaround solution for an operating system that does not have EHCI Hand-Off support. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

## ▶IDE/SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE or Floppy devices and displays the following items:

**SATA#1 Configuration**

If Compatible is selected, SATA#1 will be set to a legacy compatibility mode. Select Enhanced to set SATA#1 to the native SATA mode. The options are Disabled, Compatible and **Enhanced**.

**Configure SATA#1 as**

This feature allows the user to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear. When the option-AHCI is selected, the item-SATA AHCI will be available.)

**ICH RAID Code Base (Available when the option-RAID is selected)**

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec SATA RAID firmware to configure Adaptec SATA RAID settings. The options are **Intel** and Adaptec.

**SATA AHCI (Available when the option-AHCI is selected.)**

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only.)

**SATA#2 Configuration (Available when the option-IDE is selected)**

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

**IDE Detect Timeout (sec)**

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

**Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master**

These settings allow the user to set the parameters of Primary IDE Master/Slave, Secondary IDE Master/Slave, Third and Fourth IDE Master slots. Press <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

**Type**

Use this item to select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

**LBA/Large Mode**

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing support. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

**Block (Multi-Sector Transfer)**

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

**PIO Mode**

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 ~ 4 to allow the AMI BIOS to use PIO mode 0 ~ 4. It has a data transfer rate of 3.3 MB/s ~ 16.6 MB/s. See the table below.

**PIO Mode Select Options**

| Option Selected | PIO Mode | Max. Transfer Rate |
|---|---|---|
| 0 | PIO Mode 0 | 3.3 MB/s |
| 1 | PIO Mode 1 | 5.2 MB/s |
| 2 | PIO Mode 2 | 8.3 MB/s |
| 3 | PIO Mode 3 | 11.1 MB/s |
| 4 | PIO Mode 4 | 16.6 MB/s |

**DMA Mode**

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn. See the table below for DMA Mode Select Options.

**DMA Mode Select Options**

| Option Selected | DMA Mode | Max. Transfer Rate |
|---|---|---|
| SWDMA 0 | Single-Word DMA 0 | 2.1 MB/s |
| SWDMA1 | Single-Word DMA 1 | 4.2 MB/s |
| SWDMA 2 | Single-Word DMA 2 | 8.3MB/s |
| MWDMA 0 | Multi-Word DMA 0 | 4.2 MB/s |
| MWDMA1 | Multi-Word DMA 1 | 13.3 MB/s |
| MWDMA 2 | Multi-Word DMA 2 | 16.6 MB/s |
| UDMA 0 | Ultra DMA 0 | 16.6 MB/s |
| UDMA 1 | Ultra DMA 1 | 25 MB/s |
| UDMA 2 | Ultra DMA 2 | 33.3 MB/s |
| UDMA 3 | Ultra DMA 3 | 44.4 MB/s |
| UDMA 4 | Ultra DMA 4 | 66.6 MB/s |
| UDMA5 | Ultra DMA 5 | 100 MB/s |
| UDMA 6 | Ultra DMA 6 | 133 MB/s |

**S.M.A.R.T. For Hard disk drives**

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

**32Bit Data Transfer**

Select Enable to enable the function of 32-bit IDE data transfer. The options are **Enabled** and Disabled.

## ▶PCI/PnP Configuration

**Clear NVRAM**

This feature clears the NVRAM during system boot. The options are **No** and Yes.

**Plug & Play OS**

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

**PCI Latency Timer**

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

**PCI IDE BusMaster**

When this feature is enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled.**

**SR-IOV Supported**

Select Enabled to enable Single Root I/O Virtualization (SR-IOV) support which works in conjunction with the Intel Virtualization Technology and allow multiple operating systems running simultaneously within a single computer via natively share PCI-Express devices in order to enhance network connectivity and performance. The options are Enabled and **Disabled**.

**PCI-E Slot from SXB1/PCI-E Slot from SXB2/PCI-E Slot from SXB3**

Select Enabled to enable PCI-E SXB1 slot, PCI-E SXB2 slot or PCI-E SXB3 slot. It can also enable Option ROMs to boot computer using a network interface from these slots. (SXB1, a x16 slot, can be configured into two x8 slots. SXB2, a x8 slot, can be configured into two x4 slots.) The options are **Enabled** and Disabled.

**Onboard LAN Option ROM Select**

Select iSCSI to use iSCSI Option ROMs to boot the computer using a network device. Select PXE to use PXE Option ROMs to boot the computer using a network device. The options are iSCSI and **PXE**.

**Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM**

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot the computer using a network interface. The options for Load Onboard LAN1 are **Enabled** and Disabled. The options for Load Onboard LAN 2 are Enabled and **Disabled.**

**Boots Graphics Adapter Priority**

This feature allows the user to select the priority graphics adapter for system boot. The options are **Onboard VGA** and Offboard VGA.

## ▶Super IO Device Configuration

**Serial Port1 Address/ Serial Port2 Address**

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from

accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

**Serial Port 2 Attribute**

This feature allows the user to set COM 2 as a normal serial port or a virtual COM port used for SOL (Serial Over LAN). The options are **SOL**, and COM.

## ▶Remote Access Configuration

**Remote Access**

This allows the user to enable the Remote Access feature. The options are Disabled and **Enabled**. If Remote Access is set to Enabled, the following items will display:

**Serial Port Number**

This feature allows the user to decide which serial port to use for Console Redirection. The options are COM 1 and **COM 2**.

**Serial Port Mode**

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

**Flow Control**

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

**Redirection After BIOS POST**

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and when the Boot Loader is booting. The options are Disabled, Boot Loader, and **Always**.

**Terminal Type**

This feature allows the user to select the target terminal type for Console Redirection. The options are ANSI, **VT100**, and VT-UTF8.

**VT-UTF8 Combo Key Support**

Select Enabled to enable a terminal keyboard to send commands from a remote console. The options are **Enabled** and Disabled.

**Sredir Memory Display Delay**

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

## ▶Hardware Health Event Monitoring

This feature allows the user to monitor system health and review the status of each item as displayed.

**CPU Overheat Alarm**

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

**Warning!** 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed. 2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

**CPU 1 Temperature/CPU 2 Temperature/System Temperature**

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

**CPU1 Temperature/CPU2 Temperature**

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25$^{o}$C). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

**Low** – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

**Medium** – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

**High** – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

**Notes**: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.

2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

**System Temperature:** The system temperature will be displayed (in degrees in

Celsius and Fahrenheit) as it is detected by the BIOS.

**Fan 1 ~ Fan 8 Reading**

This feature displays the fan speed readings from fan interfaces Fan 1 through Fan 8.

**Fan Speed Control Modes**

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed/FS" to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select "Performance/PF" for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems. Select "Balanced/BL" for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configurations. Select "Energy Saving/ES" for best power efficiency and maximum quietness. The Options are: Full Speed/FS, Performance/PF, **Balanced/BL**, and Energy Saving/ES.

**Voltage Monitoring**

CPU1 Vcore, CPU2 Vcore, CPU1 DIMM, CPU2 DIMM, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt.

## ▶ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

**High Precision Event Timer**

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

**ACPI Aware O/S**

Select Yes to enable ACPI support for an operating system that supports ACPI. Select No to disable ACPI support for an OS that does not support ACPI. The options are **Yes** and No.

**ACPI APIC Support**

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

**APIC ACPI SCI IRQ**

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

**Headless Mode**

This feature is used to enable system to function without a keyboard, monitor or mouse attached. The options are Enabled and **Disabled**.

**ACPI Version Features**

This feature allows the user to select the ACPI version. The options are ACPI v1.0, ACPI v2.0 and ACPI v3.0. Please refer to ACPI's website at http://www.acpi.info/ for further explanation.

**NUMA Support**

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Disabled, **Enabled** and NUMA for SLES 11 (SUSE Linux Enterprise Server 11).

**WHEA Support**

Select Enabled to enable Windows Hardware Error Architecture (WHEA) support which will provide a common infrastructure for the system to handle hardware errors on Windows platforms in order to reduce system crashes due to hardware errors and to enhance system recovery and health monitoring. The default setting is **Enabled**.

## ▶IPMI Configuration (X8DTU-F Only)

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.

**IPMI Firmware Revision**

This item displays the current IPMI Firmware revision.

**Status of BMC Working**

The Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This item displays the status of the current BMC controller.

## ▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.

- Total Number of Entries
- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Event Timestamp
- Generator ID
- Event Message Format Version
- Event Sensor Type
- Event Sensor Number
- Event Directory Type
- Event Data.

### Clear BMC Event Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

**Caution**: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

## ▶Set LAN Configuration

Use this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

**Channel Number** - Enter the channel number for the SET LAN Config command. This is initially set to **[1]**.

**Channel Number Status** - This item displays the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

**IP Address Source**

This features allows the user to decide how an IP address is assigned to a client computer or network device. Select DHCP (Dynamic Host Configuration Protocol) to allow a client (computer or device) to obtain an IP address from a DHCP server that manages a pool of IP addresses and network information on a "request and grant" basis. Upon timeout (or lease expiration), the IP address assigned to the client can be reassigned to a new client. Select Static (Static Allocation) to allow the host server to allocate an IP address based on a table containing MAC Address/IP Address pairs that are manually entered (probably by a network administrator). Only clients with a MAC address listed in the MAC/IP Address Table will be assigned an IP address. The IP Address allocated to the client is on a longer term basis than that assigned by the DHCP mentioned in the other option. The options are **DHCP** and Static.

**IP Address**

The BIOS will automatically enter the IP address of this machine; however, it may be overwriiten. IP addresses are 6 two-digit hexadecimal numbers.

**Subnet Mask**

This item displays the current subnet mask setting for your IPMI connection. The value of each three-digit number separated by dots should not exceed 255.

**Gateway Address**

The BIOS will automatically enter the Gateway address of this machine; however, it may be overwritten. IP addresses are 6 two-digit hexadecimal numbers separated by dots.

**Mac Address**

The BIOS will automatically enter the Mac address of this machine; however, it may be overwritten. Mac addresses are 6 two-digit hexadecimal numbers separated by dots.

## ▶Event Log Configuration

**View Event Log**

Use this option to view the System Event Log.

**Mark All Events as Read**

This option marks all events as read. The options are OK and Cancel.

### Clear Event Log

This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

### PCIe Error Log

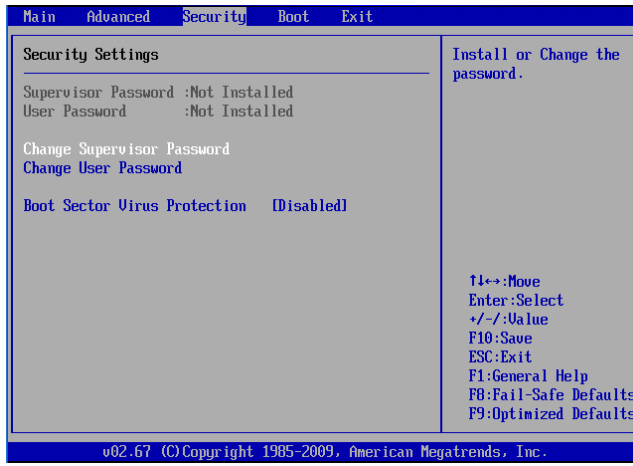
Use this option to enable PCI-Exp. error (PERR) logging. The options are Yes and **No**.

### Memory Error Log

Use this option to enable memory error logging. The options are **Yes** and No.

## 4-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.




### Supervisor Password

This item indicates if a supervisor password has been entered for the system. "Not Installed" means a supervisor password has not been used.

### User Password

This item indicates if a user password has been entered for the system. "Not Installed" means that a user password has not been used.

### Change Supervisor Password

Select this feature and press <Enter> to access the Security menu, and then enter a new supervisor Password.

**User Access Level** (Available when Supervisor Password is set as above)

Select **Full Access** to grant the user full access to the Setup utility, and change Setup settings. Select View Only to allow the user to access the Setup utility to view the settings without making changes. Select Limited to allow the user to change selected settings such as Date and Time. Select No Access to prevent the user from accessing the Setup Utility.

**Change User Password**

Select this feature and press <Enter> to access the submenu, and enter a new user password.

**Clear User Password (Available only when User Password has been set)**

This item allows you to clear a user password after it has been entered.

**Password Check**

This item allows you to check a password after it has been entered. The options are **Setup** and Always.

**Boot Sector Virus Protection**

If this feature is enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and Disabled.

**Clear User Password (Available only when User Password has been set)**

This item allows you to clear a user password after it has been entered.

**Password Check**

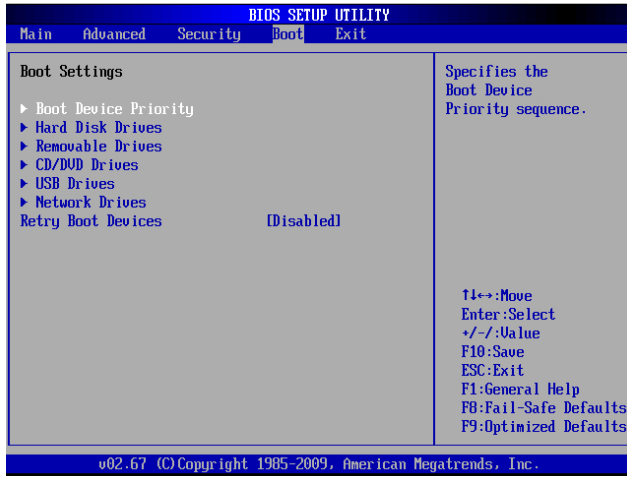
This item allows you to check a password after it has been entered. The options are **Setup** and Always.

**Boot Sector Virus Protection**

When this feature is set to Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

## 4-5 Boot Configuration

Use this feature to configure boot settings.




### ▶Boot Device Priority

This feature allows the user to specify the priority sequence of boot devices, including the1st boot device, 2nd boot device, etc. The options are Removable Devices, Hard Drive, CD/DVD, USB, Network, and Disabled.

- 1st Boot Device
- 2nd Boot Device

### ▶Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).

- 1st Drive

### ▶Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive/2nd Drive

### ▶CD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives.

- 1st Drive/2nd Drive

### ▶USB Drives

This feature allows the user to specify the boot sequence from available USB Drives.

### ▶Network Drives

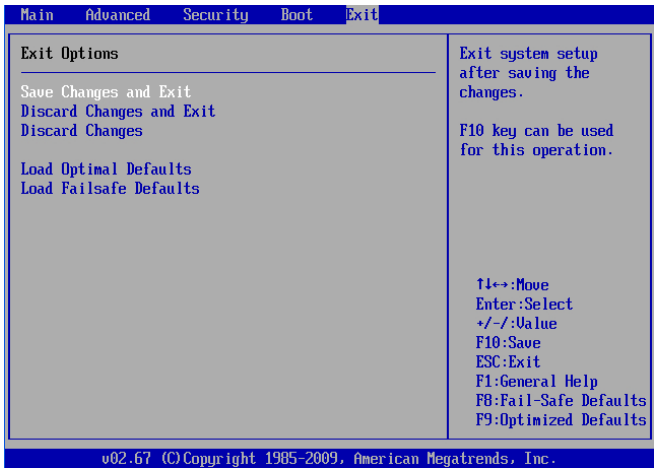
This feature allows the user to specify the boot sequence from available Network Drives.

#### Retry Boot Devices

If this feature is enabled, the system will continue to search for the next boot device if the current boot device is not available. The options are Enabled, and **Disabled**.

## 4-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.



**Save Changes and Exit**

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer so that the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

**Discard Changes and Exit**

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

**Discard Changes**

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility.

**Load Optimal Defaults**

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

**Load Fail-Safe Defaults**

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

## Notes

# Appendix A

# BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

| BIOS Error Beep Codes | | |
|---|---|---|
| **Beep Code** | **Error Message** | **Description** |
| 1 beep | Refresh | Circuits have been reset. (Ready to power up) |
| 5 short beeps+1 long beep | Memory error | No memory detected in the system |
| 8 beeps | Display memory read/write error | Video adapter missing or with faulty memory |
| 1 high (pitch)+1 low (pitch) (siren-like alarm) | System Overheat | System overheat |

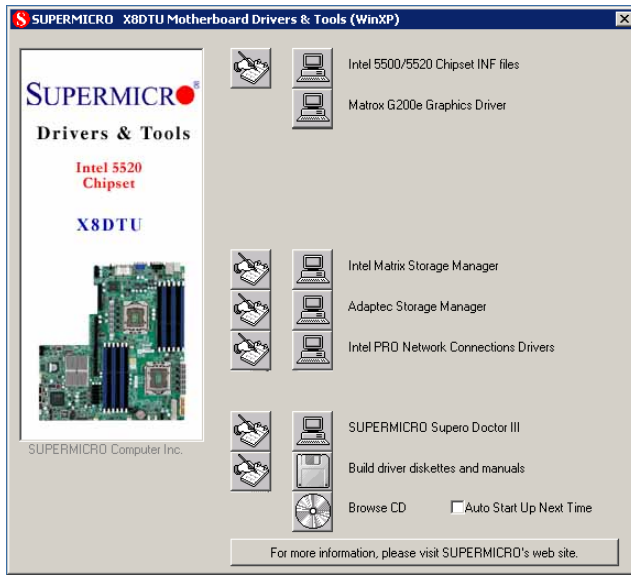
## Notes

# Appendix B

# Software Installation Instructions

## B-1 Installing Software Programs

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items. (**Note:** To install the Windows OS, please refer to the Windows OS Installation Guide posted at http://www.supermicro.com/support/manuals/.)




**Driver/Tool Installation Display Screen**

**Note 1.** Click the icons showing a hand writing on the paper to view the readme files for each item. Click on a computer icon to the right of an item to install an item (from top to the bottom) one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

**Note 2.** When making a storage driver diskette by booting into a Driver CD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

## B-2 Configuring Supero Doctor III

The Supero Doctor III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

**Note**: 1 The default user name and password are ADMIN.

**Note 2:** In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in BIOS.

**Supero Doctor III Interface Display Screen-I (Health Information)**

**Supero Doctor III Interface Display Screen-II (Remote Control)**

Super Doctor III
Remote Management
SUPERMICRO
ADMIN
System Info. | Health Info. | Performance | Remote Control | Configuration | Administration | Systems Management | Report | Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Conn.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

**Note**: SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend that you use Supero Doctor II.

# Notes

(Disclaimer Continued)

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